

# **2008 Cooperative Gypsy Moth Project**

## **ENVIRONMENTAL ASSESSMENT**

**Brownstown Ranger District  
Hoosier National Forest and  
adjacent private lands  
Monroe County, Indiana  
Sections 21-23, 26-28, 34, 35  
Township 7 North, Range 1 East**

**United States Department of Agriculture Forest Service  
Hoosier National Forest,  
Northeastern Area State and Private Forestry  
and  
Indiana Department of Natural Resources  
Division of Entomology and Plant Pathology  
Division of Forestry**

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## 1.0 PURPOSE AND NEED FOR ACTION

### 1.1 Proposed Action

The U.S. Department of Agriculture(USDA)Forest Service, Hoosier National Forest (Hoosier) and Northeastern Area State and Private Forestry; Indiana Department of Natural Resources (IDNR), Division of Entomology & Plant Pathology and Division of Forestry, propose a cooperative project to eradicate the European gypsy moth (*Lymantria dispar*) population using mating disruption on approximately 1,861 acres in Monroe County, Indiana. The project area located in Monroe County, Indiana is estimated at 2,116 acres with 1,861 acres of that being the proposed treatment site. The additional acreage considered accounts for a 300-foot buffer surrounding the treatment block. This additional 300-foot buffer allows for airplanes applying the treatment to turn and make a return flight. National Forest System (NFS) lands comprise approximately 82 percent of the proposed treatment site and private land comprises the remaining 18 percent of the proposed treatment site. Table 1 describes the land ownership in the proposed treatment site. Management Area 5.1 represents the congressionally designated Charles C. Deam Wilderness.

Table 1. Land Ownership in the Proposed Treatment Site.

OWNERSHIP	MANAGEMENT AREA <sup>1/</sup>	ACRES	PERCENT OF PROPOSED TREATMENT SITE	PERCENT OF TREATMENT BY MANAGEMENT AREA
Private		326	18	
National Forest	2.8	382		20
	5.1	1,050		56
	6.2	93		5
	7.1	10		Less than 1
NFS Subtotal		1,535	82	
Grand Total		1,861	100.0	

<sup>1/</sup> Determined in 2006 Hoosier National Forest Land and Resource Management Plan.

### 1.2 Purpose and Need for Proposal

The objective of this cooperative project is to eradicate gypsy moth by eliminating reproducing populations from the proposed treatment site.

Gypsy moth is not native to the United States and lacks effective natural controls. The caterpillars feed on the foliage of many host plants. Oaks are the preferred host species, but the caterpillars defoliate many species of trees and shrubs when oaks are not available. When high numbers of gypsy moth caterpillars are present, forests may suffer severe and repeated defoliation, which can result in reduced tree growth, branch dieback, and even tree mortality. The high numbers of caterpillars also create a public nuisance and can affect human health.

The national strategy for managing the gypsy moth includes eradication in areas not yet infested and suppression in generally infested areas (Sharov *et al.* 2002). Gypsy moths have not yet infested the area proposed for treatment in this project. The proposed treatment site is also outside the Slow the Spread transition area (Tobin 2007). The population in the proposed treatment site is currently a very low population. The optimum time to treat this potential infestation is before gypsy moths become established and spread. Without intervention, this population would continue to grow and contribute to a faster rate of spread into other non-infested areas.

### **1.3 Decisions to be Made and Responsible Officials**

All action alternatives in this document propose cooperative participation between the IDNR and the USDA Forest Service in treating gypsy moth populations in Indiana. The responsible USDA officials will choose which of the alternatives best meets the project objective and forest management goals. If the deciding officials select an action alternative, they will also determine which, if any, site-specific mitigations should be applied and what monitoring requirements would be appropriate within the project area.

This analysis will consider whether any perceived significant environmental impacts could result from the implementation of this cooperative project. If there are none, this will be documented in a Decision Notice and Finding of No Significant (FONSI). If significant environmental impacts are found and the project is to continue, an Environmental Impact Statement (EIS) would be prepared.

#### **The responsible officials for the NEPA analysis are:**

Decisions for state and private lands within the project area will be made by Michael Prouty, Field Representative, St. Paul Field Office, Northeastern Area, State & Private Forestry.

Kenneth G. Day, Forest Supervisor, Hoosier National Forest, Bedford Office will determine which alternative would be applied on the National Forest System land within the project area.

#### **The responsible officials for the implementation of the cooperative project are:**

Phil Marshall, Managing State Entomologist and Forest Health Specialist, Indiana Department of Natural Resources, Division of Entomology and Plant Pathology and Division of Forestry (respectfully), Indianapolis Office

John Seifert, State Forester, Indiana Department of Natural Resources, Division of Forestry, Indianapolis Office

### **1.4 Scope of the Analysis**

In November 1995, the USDA, Animal & Plant Health Inspection Service (APHIS) and Forest Service made available a final environmental impact statement (FEIS), entitled Gypsy Moth Management in the United States: A Cooperative Approach (USDA 1995). The Record of Decision for the FEIS was signed in January of 1996 (USDA 1996), and Alternative 6 was selected, which includes all three management strategies analyzed – suppression, eradication, and Slow the Spread. The strategy used

depends on the infestation status of the area: generally infested, uninfested, or in transition. Implementation of the 1995 FEIS preferred alternative requires that a site-specific environmental analysis be conducted to address local issues before Federal or cooperative projects are implemented. This site-specific analysis is tiered to the programmatic FEIS (USDA 1995). As part of the 1995 FEIS analysis, human health and ecological risk assessments were prepared (Human Health Risk Assessment, Appendix F to the FEIS and Ecological Risk Assessment, Appendix G to the FEIS). The purpose of tiering is to eliminate repetitive discussions of the issues addressed in the FEIS (40 CFR, 1502.20 and 1508.28 in Council on Environmental Quality, 1992). This analysis tiers to these documents.

## **1.5 Summary of Public Involvement and Notification**

On November 19, 2007, the Hoosier National Forest sent a letter announcing the cooperative project and setting a public meeting date to 120 interested and affected individuals, groups, other agencies, and legislative representatives.

The Hoosier National Forest published a legal notice in the Newspaper of Record (*Hoosier Times*, Bloomington, Indiana) on November 25, 2007. The public meeting was held on December 4, 2007 in Bloomington, Indiana.

At the public meeting, Indiana Department of Natural Resources and Hoosier National Forest officials presented alternatives for gypsy moth management. The discussion included identification and biology of the gypsy moth, pest impacts, survey methods, and control tactics. State and Hoosier officials discussed the proposed treatment site and action alternatives, including taking no action. Questions and concerns raised at the public meeting are included in Appendix A.

Information gathered at the public meeting, in submitted correspondence, and from resource professionals was used to identify issues and concerns related to the project.

## **1.6 Issues Used to Formulate the Alternatives**

Based on prior experience state officials provided additional input regarding project specific issues to be addressed in the analysis. Discussion pertaining directly to each issue as it relates to the alternatives is included in the analysis.

**Issue 1 - Human Health and Safety.** Three types of risk are addressed under this issue: 1) an aircraft accident during applications, 2) treatment materials and potential effects on people, and 3) the future effects of gypsy moth infestations on people.

**Issue 2 - Effects on Nontarget Organisms and Environmental Quality.** The major concerns under this issue are: 1) the impact of treatment materials to nontarget organisms, including threatened and endangered species that may be in the proposed treatment site: 2) the future impacts of gypsy moth defoliation on the forest resources, water quality, wilderness character, wildlife, and other natural resources: 3) potential indirect impacts of aerial treatments on nontarget organisms; and 4) potential direct or indirect impacts of aerial and/or ground treatments on Regional Forester's sensitive species, management indicator species, recreation and wilderness.

**Issue 3 - Economic and Political Impacts of Treatment vs. Non Treatment.** Gypsy moth outbreaks can have significant economic impacts due to effects on the timber resource, nursery and Christmas tree producers, and recreational activities. A potential economic impact would occur if a quarantine for gypsy moth were imposed to regulate movement of products from the forest, nursery, and recreational industries to uninfested areas.

**Issue 4 - Likelihood of Success of the Project.** The objective of this project is to eradicate gypsy moth populations in the proposed treatment site. Project success is important for delaying gypsy moth impacts to Indiana and neighboring states.

## **1.7 Authorizing Laws, Policies, and Direction**

**State.** The Division Director (State Entomologist) may cooperate with a person in Indiana to locate, check, or eradicate a pest or pathogen (Indiana Code 14-24-2-1). The Division Director may, on the behalf of the department, enter into a cooperative agreement with the United States government, the government of another state, or an agency of the United States or another state to carry out this article (Indiana Code 14-24-2-2). Aerial applicators must meet Indiana Pesticide Use and Application Law (Indiana Code 15-3-3.6) to provide safe, efficient and acceptable applications of pesticides. The Non Game and Endangered Species Conservation law (Indiana Code 14-22-34) applies to this project.

**Federal.** Authorization to conduct treatments for gypsy moth infestations is given in the Plant Protection Act of 2000 (7 U.S.C. section 7701 et seq.).

The Cooperative Forestry Assistance Act of 1978 provides the authority for the USDA and state cooperation in management of forest insects and diseases. The Secretary of Agriculture is authorized to assist in controlling forest insects and diseases directly on National Forest System land and in cooperation on other Federal and non-Federal lands of all ownerships. The law recognizes that the nation's capacity to produce renewable forest resources is significantly dependent on non federal forestland. The 2002 Farm Bill (P.L. 107-171d.) reauthorizes the basic charter of the Cooperative Forestry Assistance Act of 1978.

The National Environmental Policy Act (NEPA) of 1969 (P.L. 91 190 and 42 USC 4321 et seq.) requires a detailed environmental analysis of any proposed federal action that may affect the human environment. The courts regard federally funded state actions as federal actions.

The Federal Insecticide, Fungicide and Rodenticide Act of 1947, (7 USC 136) as amended, known as FIFRA, requires insecticides used within the United States be registered by the United States Environmental Protection Agency (EPA).

Section 7 of the Endangered Species Act prohibits federal actions from jeopardizing the continued existence of federally listed threatened or endangered species or adversely affecting critical habitat of such species.

Section 106 of the National Historical Preservation Act and 36 CFR Part 800: Protection of Historic Properties requires the State Historic Preservation Officer be consulted regarding the proposed activities.

*USDA Departmental Gypsy Moth Policy* (USDA 1990) assigns the Forest Service the responsibility to assist State and Federal agencies to eradicate isolated gypsy moth infestations that are on or contiguous with Federal lands.

Wilderness Act 1964 (P.L. 88-577) established the Wilderness Preservation System and states that wilderness "...shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these area, the preservation of their wilderness character..." The act also states "...each agency administering wilderness...shall be responsible for preserving the wilderness character of the area..."

Section 4 (d) (1) of the Wilderness Act addresses measures that can be taken as necessary to control fire, insects, and disease in wilderness areas.

Forest planning occurs at three different levels: national, regional, and forest. This project meets the objective associated with all three levels of planning.

The *USDA Forest Service Strategic Plan FY 2007-2012* (USDA FS 2007) presents several goals and objectives that would be met by this project. These include:

- Goal 1. Restore, Sustain, and Enhance the Nation's Forests and Grasslands.
  - Objective 1.4 – Reduce adverse impacts from invasive and native species, pests, and diseases.
  - Objective 1.5 – Restore and maintain healthy watersheds and diverse habitats.
- Goal 4. Sustain and Enhance Outdoor Recreation Opportunities.
- Goal 7. Provide Science-based Applications and Tools for Sustainable Natural Resources Management.

Forest Service Manual (FSM) 2324.04b also states that the Regional Forester can approve insect and disease control projects within wilderness in the event that:

- There is an immediate threat of unacceptable damage to resources outside the wilderness boundary,
- The threat cannot reasonably be abated by control actions taken outside the wilderness boundary.

Furthermore, FSM 2324.11 considers the need to control insect and plant disease epidemics that threatens adjacent lands or resources.

At the Regional level, the Eastern Region of the Forest Service has created a *Strategic Framework for the Eastern Region* (USDA FS 2005). This proposal would meet most of the goals contained in the Framework, including:

- Protect Ecosystems Across Boundaries,
- Connect Citizens to the Land
- Walk the Talk for Sustainability, and
- Revolutionize Effectiveness and Efficiency.

This project complies with the *Hoosier National Forest Land and Resource Management Plan (Forest Plan)*. This Forest level planning document contains goals and directions applicable to site-specific projects on the Hoosier. The *Forest Plan* (USDA FS 2006) specifically addressed the following goals:

- Maintain and Restore Sustainable Ecosystems
- Maintain and Restore Watershed Health,
- Provide for a Visually Pleasing Landscape, and
- Provide for Recreation Use in Harmony with Natural Communities.

Specific components of some goals in the *Forest Plan* include developing and maintaining forest stands of appropriate composition and structure to meet management goals. Forest-wide there is a desire to increase oak and hickory regeneration. This would provide a diversity of habitat needs for viable populations of native and desired non-native species. Oaks are a preferred species of the gypsy moth.

The Hoosier also provides a much-needed niche in Indiana for outdoor recreation experiences consistent with protection of the forest's natural resources. Wilderness based recreation is very limited in Indiana; the Charles C. Deam Wilderness is the only congressionally designated wilderness in the State.

Finally the Hoosier *Forest Plan* allows for control of insects and disease in Management Area 5.1 (Wilderness) granting the use of pesticides as necessary to prevent the loss of significant aspects of the wilderness, or to prevent significant losses to resource values on private or public lands bordering the wilderness.

## 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

### 2.1 Process Used to Formulate the Alternatives

The interdisciplinary (ID) team is comprised of staff from IDNR, Division of Entomology and Plant Pathology; USDA Forest Service, Northeastern Area State and Private Forestry and the Hoosier National Forest. The ID team collaborated and formulated several alternatives to treat the gypsy moth populations in the proposed treatment site.

The FEIS (USDA 1995), which this document is tiered to, allows the USDA to participate in the Cooperative Gypsy Moth Project for Indiana. The USDA can assist in conducting eradication, slowing the spread, and implementing suppression strategies. The FEIS lists the treatment options for each of the strategies (USDA 1995, Vol. II, p. 2-15). For the eradication strategy, the following six treatment options may be considered: 1) *Bacillus thuringiensis var. kurstaki* (Btk), 2) diflubenzuron (Dimilin), 3) nucleopolyhedrosis virus (Gypchek), 4) mass trapping, 5) mating disruption (pheromone flakes), and 6) sterile insect release. These treatment options from the FEIS will be used as the alternatives for the site-specific analysis to be included in the EA.

### 2.2 Alternatives Eliminated from Detailed Study

The following alternatives were considered but were eliminated from further consideration or detailed study at this time:

**Diflubenzuron (Dimilin).** The label for diflubenzuron (Dimilin) prohibits its use over wetlands and directly to water. The proposed treatment site does contain a few small ponds, therefore this alternative was not considered for this project. This does not preclude the consideration and use of Dimilin in future projects.

**Gypsy moth specific nucleopolyhedrosis virus (Gypchek).** There is a very limited supply of gypsy moth nucleopolyhedrosis virus, and it is targeted for use in special areas that have high environmental concerns (e.g., treatment sites that have threatened or endangered species and that could be impacted by other treatment options). Gypchek is the trade name for the Forest Service formulation of nucleopolyhedrosis virus, a naturally occurring gypsy moth-specific pathogen. Data on the effectiveness of Gypchek in low level gypsy moth populations is limited. Gypchek is used in suppression projects against moderate to high gypsy moth populations (USDA 1995, Vol. II, p. A-7). Therefore, Gypchek is not considered for this project. In future projects, Gypchek may be evaluated for use.

**Mass Trapping.** This treatment option places gypsy moth traps at a close spacing in the proposed treatment site. “The objective of this treatment is to capture male gypsy moths before they have a chance to locate and mate with female moths”(USDA 1995, Vol. II, p A-7). “For mass trapping, delta or milk carton traps are deployed in an intensive grid pattern in an infested area and an adjacent buffer area at the rate of at least nine traps per acre” (USDA 1995, Vol. II, p. A-8). Thus, it is very labor intensive, especially over large areas.

Mass trapping has proved capable of eradicating gypsy moth at very low population levels in isolated introductions that are small in size (less than 40 acres). The use of mass trapping can not meet the

purpose of eradicating the gypsy moth population from the proposed treatment site as the site is greater than 40 acres. This alternative may be considered for use in future projects.

**Sterile insect release.** The 1995 FEIS documents the use of sterile insects for elimination of isolated gypsy moth populations. It also documents the obstacles to using this alternative, including the limited release period; the need to synchronize production of sterile pupae and release into the population; and the limited availability. This treatment alternative is currently not available and recent eradication or slow-the-spread treatment projects have not used it. After consideration of these obstacles, this alternative was not considered for this proposed treatment site. In future projects, it may be evaluated for use.

### 2.3 Alternatives Considered in Detail

**Alternative 1 - No action.** With this alternative, no action to control or eradicate the current gypsy moth population in the proposed treatment site would occur. Under this alternative as populations establish and spread, damage and regulatory action would occur sooner than if an action alternative is selected. A quarantine would affect forest management activities and uses. Gypsy moth trapping surveys would also continue to monitor increasing populations. This alternative is required for analysis by the National Environmental Policy Act but does not meet the purpose and need for action. Selection of this alternative would allow populations to establish, reproduce, and spread at a quicker rate than any of the action alternatives.

**Alternative 2 - Mating disruption.** This treatment would consist of one aerial application of pheromone flakes prior to the emergence of male moths. Treatment would occur in mid-June to early July. Mating disruption relies on the use of the gypsy moth sex pheromone, disparlure. Female moths are flightless and naturally release a pheromone to attract males. The objective of mating disruption is to saturate the proposed treatment site with enough pheromone sources to confuse the male moths and prevent them from finding and mating with female moths. Mating disruption is considered specific to gypsy moth and is not known to cause impacts to nontarget organism populations, water quality, microclimate, or soil productivity and fertility (USDA 1995, Vol. II, p. 4-67).

This treatment uses airplanes flying at low levels (about 50 feet above the trees) to drop plastic flakes that are impregnated with the gypsy moth pheromone. The formulation of Disrupt II (see Appendix D – example of product labels) consists of small, green colored plastic flakes, approximately 1/32 inch x 3/32 inch (1 x 3 mm) in size, thus the name “pheromone flakes”. A sticking agent, Monsanto's Gelva 2333, is applied to the flakes as they are dispersed from the aircraft, which aids in the distribution of the flakes throughout all levels in the forest canopy where mating could potentially occur. The flakes are applied at a rate of 6 to 15 grams active ingredient (disparlure) per acre. At the application high rate of 15 grams of disparlure per acre, 85 grams of flakes are applied in 2 fluid ounces of sticker per acre (2 flakes per square foot) (Thorpe *et al.* 2006). All of the ingredients in the Gelva 2333 sticker are considered non-hazardous to public health if used as an additive in the insecticide formulation (40 CFR 180.1001).

Pheromone flakes have proven effective at eliminating gypsy moths at very low population levels. The application of pheromone flakes would meet the purpose and need of eliminating gypsy moth from the proposed treatment site.

**Alternative 3 – Btk.** This treatment uses up to three applications of *Bacillus thuringiensis* var. *kurstaki* (Btk) at 24 to 38 billion international units (BIU) per acre applied from the air or ground. The applications would begin when leaf expansion is near 50 percent and when first and second instar caterpillars are present and feeding. This usually occurs between mid April to early May in southern Indiana. The next application would follow no sooner than four days after the prior application. Most commercial formulations of Btk are aqueous flowable suspension containing 48 or 76 BIU/gal (Appendix D – examples of product labels). For aerial application at 24 to 38 BIU, less than 3.0 quarts of the product would be applied per acre.

Btk has been a commonly used treatment option in cooperative gypsy moth projects in Indiana and in other states. Btk is a naturally occurring soil-borne bacterium that is mass-produced and formulated into a commercial insecticide. The Btk strain is effective against caterpillars, including the gypsy moth caterpillar. Caterpillars ingest Btk while eating the foliage. Once in the midgut, Btk becomes active and causes death within a few hours or days (USDA 1995, Vol. II, p. A3-A5). Btk may affect nontarget species of spring-feeding caterpillars in the proposed treatment site. Nontarget lepidopterans generally re-colonize treatment sites in less than 2 years (USDA 1995, Vol. II, p. 4-52 to 4-55). Human exposure to Btk provides little cause for concern, though direct exposure to the spray may cause temporary eye and respiratory tract irritation in a few people (USDA 1995, Vol. II, p. 4-13).

Btk has proven effective at eliminating the gypsy moth at low population levels. The use of Btk meets the project objective of eliminating gypsy moth populations from the proposed treatment site.

**Alternative 4 –Btk and mating disruption.** The use of this alternative provides flexibility to select Btk or mating disruption alone or in combination based on the following criteria:

- gypsy moth population level,
- habitat type (urban, rural, open water, or wetland),
- nontarget organisms,
- safety, and
- cost and project efficiency.

The use of this alternative meets the objective of eliminating gypsy moth populations from the proposed treatment site.

## **2.4 Alternatives Developed but Eliminated From Further Study**

**Alternatives 2, 3, or 4 - Excluding Treatment in Management Area 5.1 (Wilderness).** Alternatives were considered that did not take action in Management Area 5.1. These alternatives are outside the scope of the analysis as they do not meet the project's purpose and need for action. Alternatives that do not propose treatments in the wilderness area (Management Area 5.1) were not analyzed in detail since they do not meet the purpose and need of eradicating gypsy moth from the proposed treatment site.

This project addresses the very low gypsy moth population that has been detected on the Hoosier National Forest and adjacent private lands. The threat that justifies proposed treatment is based on spread, not the threat of defoliation where the treatments are conducted. The wilderness area comprises a large part of this proposed treatment site (56 percent). For eradication of gypsy moth to be successful,

the wilderness area must be treated. Not treating the wilderness area would create pockets where an increased, unacceptable rate of spread may occur, increasing the likelihood that a more intrusive treatment to control the spread would be needed at a later time. To eliminate the wilderness area from the proposed treatment to eradicate gypsy moth would not meet the purpose and need described for the project.

Appendix E includes a Minimum Requirements Decision Guide (MRDG) for this project. Direction or policy does not require preparation of the MRDG, but it is recommended that one be prepared when making decisions regarding administrative actions in wilderness. The MRDG is a process to identify, analyze, and select management actions that are the minimum necessary for wilderness administration. The MRDG augments the NEPA analysis. The concept of the MRDG was developed from Section 4(c) of the Wilderness Act of 1964.

## 2.5 Comparative Summary of Alternatives

Table 2. Summary of Environmental Consequences for Alternatives by Issues from Chapter 4

	Issue 1 Human Health & Safety (page 17)	Issue 2 Effects on Nontarget Organisms and Environmental Quality (page 18)	Issue 3 Economic and Political Impacts (page 24 )	Issue 4 Likelihood of Success of the Project (page 24 )
Alternative 1 No Action	<ul style="list-style-type: none"> <li>- No risk of an aircraft accident or spill.</li> <li>- No risk of Btk contact with humans.</li> <li>- Gypsy moth outbreaks will occur sooner with the associated nuisance and health impacts to humans.</li> <li>- Increased tree mortality would increase limb and tree hazards</li> </ul>	<ul style="list-style-type: none"> <li>- Possible indirect impacts to native lepidopterans</li> <li>- Future gypsy moth impacts will occur sooner, which includes defoliation and reduction in the oak component of forest stands.</li> <li>- Karst invertebrates would be impacted</li> <li>- Butternut tree species may be directly impacted</li> <li>- May alter habitat for Cerulean warbler</li> <li>- May create transitory habitat for woodcock</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would occur sooner.</li> <li>- Spread of gypsy moth through these counties and into adjacent counties would not be slowed.</li> <li>- Defoliation would likely occur sooner</li> <li>- Future impacts on state budgets would increase</li> </ul>	<ul style="list-style-type: none"> <li>- Gypsy moth would not be eliminated from the proposed treatment site and the project objective would not be met.</li> </ul>
Alternative 2 Mating Disruption	<ul style="list-style-type: none"> <li>- Slight risk of aircraft accident.</li> <li>- No effect to human health expected</li> <li>- Delay effect of gypsy moth outbreaks on humans.</li> </ul>	<ul style="list-style-type: none"> <li>- Delay the impact of gypsy moth defoliation on environmental quality.</li> <li>- Unknown effects to karst species</li> <li>- Short term impact to recreation use from low flying aircraft</li> <li>- “Treatment effects are likely to be insignificant to Indiana bat”</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would not be implemented in the county during the current year.</li> <li>- Impacts under alternative 1 delayed</li> </ul>	<ul style="list-style-type: none"> <li>- Success is likely</li> </ul>
Alternative 3 Btk	<ul style="list-style-type: none"> <li>- Slight risk of aircraft accident and pesticide spill.</li> <li>- Contact with Btk may cause mild and temporary irritation (eye, skin &amp; respiratory) to a few individuals</li> <li>- Delay effect of gypsy moth outbreaks on humans.</li> </ul>	<ul style="list-style-type: none"> <li>- Direct impact on spring feeding caterpillars, temporary reduction in local populations.</li> <li>- Adverse effect on Indiana bat is unlikely.</li> <li>- Delay the impact of gypsy moth defoliation on environmental quality.</li> <li>- Unknown effects to cave and karst species</li> <li>- Likely short term impact to West Virginia white butterfly</li> <li>- No plastic would be added to Management Area 5.1</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would not be implemented in the county during the current year.</li> <li>- Slows the spread of gypsy moth.</li> <li>- Impacts under alternative 1 delayed</li> </ul>	<ul style="list-style-type: none"> <li>- Success is likely</li> </ul>
Alternative 4 Btk and Mating disruption	<ul style="list-style-type: none"> <li>- Same as alternatives 2 and 3</li> </ul>	<ul style="list-style-type: none"> <li>- Same as alternatives 2 and 3</li> </ul>	<ul style="list-style-type: none"> <li>- Same as alternatives 2 and 3</li> </ul>	<ul style="list-style-type: none"> <li>- Success is likely</li> </ul>

### 3.0 AFFECTED ENVIRONMENT

#### 3.1 Description of the Proposed Treatment Site

There are approximately 257,962 acres in Monroe County and 140,607 acres of forest that contain both favorable and unfavorable host species. The proposed treatment site contains 1,861 acres. The project area is composed of trees associated with Federal forest land, Federal wilderness area, rural residences, and woodlots. The Federal wilderness area, Charles C. Deam Wilderness, is the only congressionally designated wilderness in the State of Indiana. Houses and a church also occur in the project area. The project area was detected in 2006 (survey traps placed 3 kilometers apart) and was delimited (traps placed at 500 meters apart) in 2007. Survey results indicate a very low gypsy moth population.

The project area occurs within the Brown County Hills Ecological Subsection (Zhalnin and Parker 2005). Ecological land type phases (ELTPs) within this larger ecological subsection provide more detail that is related to ecological communities. These designations integrate information that includes soil, topography, and plant community characteristics. Ecological land type phases that occur in the project area are listed in Table 3 and depicted in the map that follows (Figure 1).

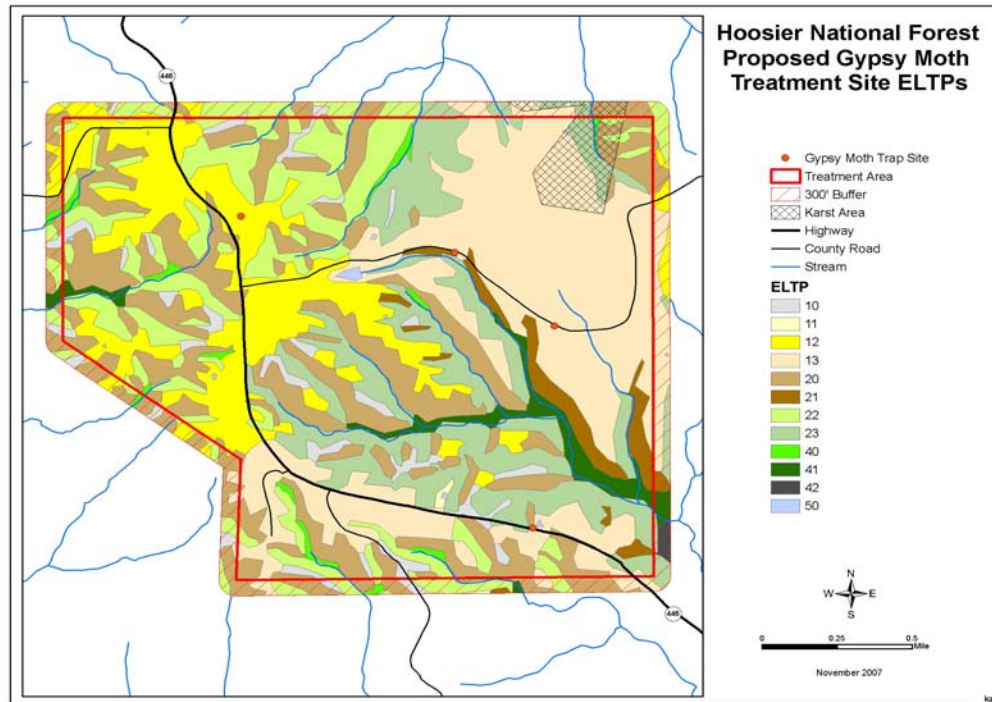
Table 3. Ecological land type phase information of the project area.

ECOLOGICAL LAND TYPE PHASE AND DESCRIPTION	ACRES	% OF AREA
ELTP 10 Quercus alba-prinus / Vaccinium, Dry Ridges	66	3
ELTP 11 Quercus alba-Acer saccharum / Parthenocissus, Dry-Mesic Ridges	2	<1
ELTP 20 Quercus alba-prinus / Carex Picta-Vaccinium, Dry Slopes	454	21
ELTP 21 Quercus alba-Acer saccharum / Parthenocissus, Dry-Mesic Slopes	54	2
ELTP 13 Acer saccharum / Arisaema-Jeffersonia, Mesic Ridges	558	26
ELTP 23 Acer saccharum / Jeffersonia, Mesic Slopes	314	15
ELTP 12 Fagus-Acer saccharum / Arisaema, Mesic Ridges	305	14
ELTP 22 Fagus-Acer saccharum / Arisaema, Mesic Slopes	286	14
ELTP 40 Fagus-Acer saccharum / Arisaema, Mesic Bottomlands	21	1
ELTP 41 Platanus / Asarum, Wet-Mesic Bottomlands	51	2
ELTP 42 Fagus-Acer saccharum / Boehmeria-Asarum, Bottomlands	2	<1
ELTP 50 Wetlands / Water	3	<1
Total	2,116	100

Gypsy moths tend to more severely impact areas dominated by oaks (*Quercus* spp.). While oaks are likely scattered throughout all the above ecological land type phases, they are a dominant component of ecological land type phases 10, 11, 20, and 21. These ecological land type phases encompass more than 570 acres of the project area. Taylor Branch, a perennial stream, occurs in the southeast quadrant of the proposed treatment site.

The IDNR and USDA Animal Plant Health Inspection Services (APHIS) have conducted site-specific surveys to determine occurrence of the gypsy moth in the proposed treatment site. This is part of an ongoing effort to monitor the spread of the gypsy moth throughout the State of Indiana (IDNR 2007, Tobin and Blackburn 2007).

Figure 1. Ecological land type phases in the project area.



### 3.2 Threatened and Endangered Species

This section discloses the environmental effects of implementing the proposed action on Federally threatened and endangered species. The effects and cumulative effects analysis area boundaries are the same as the proposed treatment site boundary. This is a suitable boundary since the effects of the project would occur during implementation and would result in short-term impacts.

A biological evaluation (BE) was prepared in compliance with the Endangered Species Act, Forest Service Manual (FSM) 2670 and 2620, and Forest Service Handbook (FSH) 2609.13. The BE contains site-specific habitat information and a detailed discussion of expected effects for the proposed action (Alternative 2) only. The biological evaluation and its findings are hereby incorporated by reference (McCreedy 2008). The project level biological evaluation tiers to the Biological Opinion (USDI FWS 2006) prepared for the *Forest Plan*. No critical habitat for any of the federal threatened or endangered species occurs in the project area. Table 4 provides a summary of the findings from the biological evaluation.

Table 4. Summary of project-specific effects determinations<sup>1</sup> to federal threatened and endangered species.

FEDERALLY LISTED SPECIES	STATUS	SPECIES PRESENT	HABITAT PRESENT	SPECIES AFFECTED	HABITAT AFFECTED	EFFECTS
Fanshell ( <i>Cyprogenia stegaria</i> )	E	No	No	No	No	<b>NE</b>
Gray bat ( <i>Myotis grisescens</i> )	E	No	No	No	No	<b>NE</b>
Indiana bat ( <i>Myotis sodalis</i> )	E	Yes	Yes	Yes	Yes	<b>NL</b>
Rough pigtoe pearly mussel ( <i>Pleurobema plenum</i> )	E	No	No	No	No	<b>NE</b>

<sup>1</sup> Determinations:

**NE** = No effect / no adverse modification:

“This conclusion is reached if the proposed action and its interrelated and interdependent actions will not directly or indirectly affect listed species or destroy/adversely modify designated critical habitat.”

**NL** = May affect, is not likely to adversely affect species / adversely modify critical habitat:

“This conclusion is appropriate when effects to the species or critical habitat are expected to be beneficial, discountable or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact (and should never reach the scale where take occurs), while discountable effects are those that are extremely unlikely to occur.”

The *Forest Plan* lists the following federal threatened or endangered species as likely to occur on the Hoosier:

- The endangered fanshell mussel (*Cyprogenia stegaria*),
- The endangered gray bat (*Myotis grisescens*),
- The endangered Indiana bat (*Myotis sodalis*), and
- The endangered rough pigtoe mussel (*Pleurobema plenum*).

#### Fanshell

The fanshell inhabits, or potentially inhabits, segments of the East Fork of the White River in Lawrence and Monroe County in or near the Hoosier. Range-wide recovery of the fanshell depends on the improvement of water quality and re-establishment of natural stream flows in the East Fork of the White River. Activities proposed in the project do not occur in immediate proximity to the East Fork of the White River, and they are limited in scope in their potential to generate effects of consequence to mollusks. Implementation of the proposed action would result in no effect to the fanshell.

### Gray bat

The gray bat uses caves for both hibernation and roosting, foraging primarily over permanent water sources, often at substantial distances from their roosts. There are no known gray bat hibernacula or maternal roost on the Hoosier. There are three records of occurrence of the gray bat within the Hoosier and an additional record adjacent to the Forest boundary (McCreedy 2008). Implementation of proposed action alternative (Alternative 2) would not result in creation of new permanent water sources likely to be used by the gray bat. The project would also not impair any existing wetlands or perennial streams. Given that the gray bat likely does not occur in the project area, and no habitat used by the gray bat would be altered, no effects would be expected to the gray bat.

### Indiana bat

The Hoosier encompasses at least one Priority Three hibernacula for Indiana bat. No activities are proposed to occur in proximity to known hibernacula. No known hibernacula occur within 10 miles of the project area. USDI Fish and Wildlife Service captured an adult male Indiana bat in close proximity to the project area in 1996. This suggests that the Indiana bat may occupy suitable habitats in proximity to the project area. The U.S. Fish and Wildlife considers the project area to be utilized by the Indiana bat (*Myotis sodalis*) (Appendix C – U.S. Fish and Wildlife Service letter).

The presence of maternal colonies of Indiana bat in the project area is currently unknown. These colonies have frequently been located in riparian areas that support remnant, large, decadent ash (*Fraxinus spp.*), elms (*Ulmus americana*), or cottonwoods (*Populus deltoides*) exposed to the sun in a gap formed by perennial streams (Carter 2006). Ecological land type phase 41 (Table 3 and Figure 1) represents this habitat in the project area.

The Hoosier is a relatively closed canopy second growth forest. These conditions may present less than ideal foraging habitat for the Indiana bat, which prefers mature forested habitats with broken or open canopies, canopy gaps, and forest edges.

Virtually all studies of food habits of the Indiana bat confirm the importance of lepidopterans (butterflies and moths) in the diet of Indiana bat (Kurta and Whitaker 1998, Lee and McCracken 2004, Murray and Kurta 2002, Tuttle *et al.* 2006, Whitaker 2004). Use of *Bacillus thuringiensis* var. *kurstaki* (Btk) as proposed in Alternative 3 and 4 would affect this dietary component of the Indiana bat.

### Rough Pigtoe

The pigtoe potentially inhabits segments of the East Fork White River in Lawrence and Martin Counties (south of the proposed treatment site). Range-wide recovery of the pigtoe depends on improvement of water quality and re-establishment of natural stream flows in the East Fork White River system. The proposed treatment is not likely to affect watersheds inhabited by the pigtoe. Activities would have limited potential to generate effects to mollusks. Implementation of the project is expected to have no effect on the pigtoe.

## **3.3 Protection of Historic Properties**

“Pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. § 470f) and 36 C.F.R. Part 800, the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has conducted an analysis of the materials dated November 30, 2007 and received on December 3, 2007, for the above

indicated project in Hoosier National Forest, Monroe County, Indiana. We see no reason to object to the USFS November 30, 2007 finding that no historic properties within the area of potential effects will be affected by the above indicated project” (Appendix C – Agency Letters).

## 4.0 ENVIRONMENTAL CONSEQUENCES

This section reports the scientific and analytic basis for the comparison of alternatives. It describes the probable consequences (effects) of each alternative for each issue

### 4.1 Human Health and Safety (Issue 1).

**Alternative 1 – No action.** For this alternative, there would be no cooperative project, therefore risk of human contact with pheromone flakes or Btk, or risk of an aircraft accident during application, would not exist. However, future impacts by gypsy moth to human health will occur sooner under Alternative 1 than if treatment is used to eradicate this gypsy moth population. Gypsy moth outbreaks have been associated with adverse human health effects, including skin lesions, eye irritation, and respiratory reactions. Gypsy moth caterpillars can become a serious nuisance that can cause psychological stress in some individuals (USDA 1995, Vol. II, p. 4-9). Increased tree mortality would cause trees to fall often in campsites or across trails. Long-term safety effects would occur in association with fallen limbs and trees.

**Alternative 2 - Mating disruption.** The toxicity of insect pheromones to mammals is relatively low and their activity is target specific. Therefore the EPA requires less rigorous testing of these products than of conventional insecticides. Risk to human health due to exposure to disparlure, the active ingredient in pheromone flakes, is discussed in the FEIS (USDA 1995, Vol. II, pp. 4-30 to 4-32). Once absorbed through direct contact, disparlure persists in humans and individuals exposed to disparlure may attract adult male moths for prolonged periods of time. This persistence is viewed as a nuisance and not a health risk (USDA 1995, Vol. III, 8-1). In acute toxicity tests, disparlure was not toxic to mammals, birds, or fish (USDA 1995, Vol. IV, 5-5) therefore no effects to human health are anticipated.

A slight risk of an accident always exists when conducting aerial applications – mating disruption uses one application. To further reduce this risk, a detailed work and safety plan is required prior to program implementation which outlines guidelines for aircraft inspections, pheromone flake loading, and conditions for safe applications.

The effect of gypsy moth outbreaks on humans would be delayed using this alternative.

**Alternative 3 - Btk.** Human exposure to Btk provides little cause for concern about health effects. “On the basis of both the available epidemiology studies as well as the long history of use, no hazard has been identified for members of the general public exposed to Btk formulations” (USDA 1995, Vol. III, p. 4-15). Exposure to Btk may result in temporary eye, skin, and respiratory tract irritation in a few people. A detailed analysis of the risks posed to humans by Btk was conducted for the FEIS -- Human Health Risk Assessment (USDA 1995, Vol. III). Glare and O’Callaghan provide a comprehensive review of *Bacillus thuringiensis*, including Btk. They conclude with this statement, “After covering this vast amount of literature, our view is a qualified verdict of safe to use” (Glare and O’Callaghan, 2000).

A slight risk of an accident always exists when conducting aerial applications – Btk uses up to three applications. To further reduce this risk, a detailed work and safety plan is required prior to program implementation, which outlines guidelines for aircraft inspections, Btk loading, and conditions for safe applications. The effect of gypsy moth outbreaks on humans would be delayed using this alternative.

**Alternative 4 –Btk and Mating Disruption.** The human health and safety consequences stated above for Alternatives 2 and 3 apply to this alternative.

#### **4.2 Effects on Nontarget Organisms and Environmental Quality (Issue 2).**

##### **Alternative 1 – No Action**

With no treatments in the current year, future impacts by the gypsy moth would occur sooner and populations would increase. Many studies describe the capability of gypsy moth caterpillars to defoliate extensive areas (Gottschalk *et al.* 1998, Scarbrough and Juzwik 2004, Tobin and Whitmire 2005). Defoliation by the gypsy moth will cause selective mortality of preferred host trees. During outbreaks, forest ecosystems can change due to a reduction of the oak component and an increase of tree species that are less desired by gypsy moth, such as maple and ash. Oak forests would likely consist of a more mixed composition in the future; though oak would still be a component.

Gypsy moth defoliation and subsequent tree mortality can affect nontarget organisms by dramatically changing habitat and wilderness character on a local scale. Heavy defoliation can remove food for other leaf-feeding species, including other caterpillars. However, it can also create new habitat for some species by creating snags and increasing understory plant development by increasing light penetration into defoliated areas. Impacts on a larger scale (national, regional, or state) are subtle, gradual, and may be noticeable only after many years or decades (USDA 1995, Vol. II, p. 4-74). Short term and long term changes in nontarget species have been shown for moderate and heavy defoliation (USDA 1995, Vol. II, p. 4-47 and 4-50). An Ecological Risk Assessment (USDA 1995, Vol. IV) examined gypsy moth impacts on a wide variety of species (mammals, birds, reptiles, amphibians, fish, insects, mollusks, crustaceans, and other invertebrates). Further discussion of gypsy moth and its impact on forest conditions can be found in the FEIS (USDA 1995, Vol. II, p. 4- 41 and 4-74).

##### Regional Forester Sensitive Species

There are 146 Regional Forester sensitive species (RFSS) to be considered.

Table 5. Summary of RFSS species types considered.

COUNT	SPECIES TYPE	COUNT	SPECIES TYPE
2	Amphibians	8	Birds
4	Fish	44	Karst Invertebrates
5	Mammals	12	Mollusks
2	Non-vascular Plants	2	Reptiles
39	Terrestrial Invertebrates	28	Vascular Plants

Detailed summaries of life history traits and habitat associations of Regional Forester’s sensitive species on the Hoosier, and the history of locations of these species on the Forest, are detailed in the biological evaluation of the *Hoosier National Forest Land and Resource Management Plan* (USDA FS 2005). Summary information regarding life history traits and Forest distribution of all Hoosier National Forest

Regional Forester's sensitive species (USDA FS 2006a, USDA FS 2006b) is contained within the project record on file at the Hoosier National Forest Supervisor's Office in Bedford, Indiana.

Any potential effect, regardless of project alternative, is dependent on the distribution of any particular Regional Forester's sensitive species. Discussion of potential effects will be restricted to those species likely to occur, or for which habitat occurs, within the project area.

There is known karst topography in the northeast portion of the project area. These features harbor a number of Regional Forester sensitive species types (Table 5; Lewis *et al.* 2004). The karst features occur in ecological land type phases dominated by oaks (Table 3 and Figure 1). This area would be susceptible to defoliation if an untreated outbreak of the gypsy moth were to occur. This would alter nutrient cycles, microclimate, and other ecosystem characteristics (Lovett *et al.* 2004, Lovett *et al.* 2006). Consequently, it may be reasonable to anticipate that an untreated outbreak of the gypsy moth, in this area of karst topography, would impact karst invertebrates.

The only designated Regional Forester's sensitive species on the Hoosier that would be directly impacted would be the butternut (*Juglans cinerea*) (Schultz 2003). Though butternut is not a preferred species of the gypsy moth it would be susceptible to defoliation (Liebhold *et al.* 1995). The butternut is a rare tree on the Hoosier and occurs at several locations in proximity to the proposed treatment site.

The Cerulean warbler (*Dendroica cerulea*) is often associated with large tracts of mature upland mesic forest. Nests occur in the canopy among dense foliage (Burhans *et al.* 2002). Though frequently described as exploiting forest gaps, widespread defoliation in the event of an untreated gypsy moth outbreak may alter suitable habitat for Cerulean warbler to such an extent that nesting would be disrupted.

Numerous lepidopterans appear on the Regional Forester's sensitive species list. Nearly all are associated with barrens habitats. Competition for forage would not impact these barrens associated species as most of these species inhabit barrens areas in the southern half of the forest and are associated with herbaceous plants instead of trees. There may be some indirect impacts to native butterflies and moths of hardwood forests in the event of an untreated infestation of the gypsy moth.

#### Management Indicator Species (MIS)

Management indicator species on the Hoosier include the Acadian flycatcher (*Empidonax virens*), American woodcock (*Scolopax minor*), Louisiana waterthrush (*Seiurus motacilla*), wood thrush (*Hylocichla mustelina*), and the yellow-breasted chat (*Icteria virens*). Yellow-breasted chat and American woodcock represent early successional hardwood habitat. The remaining species are associated with mature forest of varying sized tracts from wood thrush on small tracts, to Louisiana waterthrush and Acadian flycatcher, which require much large tracts of interior forested habitat (USDA FS 2006).

If left untreated it is assumed that defoliation of the area would occur. Defoliation resulting in tree mortality would most likely occur in areas dominated by oaks. This would produce transitory habitats that would benefit species such as woodcock but would be unlikely to produce significant amounts of shrub habitat on lower mesic sites that are typical of breeding habitat for woodcock.

The Louisiana waterthrush “Most frequently breeds along gravel-bottomed streams flowing through hilly, deciduous forest...Establishes territories early in spring when streams are flowing, but by the time nestlings fledge only pools of stagnant water may remain” (Robinson 1995). Defoliation and tree mortality, should this occur, will most likely occur within upland sites dominated by oaks. That is, habitats likely to be occupied or used by the Louisiana waterthrush are unlikely to be affected.

### Recreation and Wilderness

If no treatment occurred to eliminate gypsy moth populations in the project area defoliation would likely occur. This would affect wilderness character of the area for some visitors. Long-term effects would occur as a result of not treating gypsy moth populations. Repeated defoliation would increase mortality which would cause trees to fall often in campsites or across trails. This would effect overall experience for the users in the area.

### **Alternative 2 – Mating Disruption**

This treatment would apply one aerial application of pheromone flakes to disrupt mating of adult gypsy moths. The pheromone excreted by female gypsy moths is uniquely specific to attract solely male gypsy moths during the breeding cycle. Therefore, the mating disruption treatment does not affect other lepidopteran species.

A quantitative assessment of risk from mating disruption was not conducted for the FEIS because of disparlure’s low toxicity to vertebrates and specificity to the gypsy moth. As used in mating disruption, disparlure is not likely to impact nontarget organisms (USDA 1995, Vol. II, p. 4-67). The toxicity of insect pheromones to mammals is relatively low. In acute toxicity tests, disparlure was not toxic to mammals, birds, or fish (USDA 1995, Vol. IV, 5-5). At normal application rates, concentration of the pheromone (disparlure) impregnated in the flakes remains active for one season only.

The U.S. Fish and Wildlife Service considers the project area to be utilized by the Indiana bat (*Myotis sodalis*). USFWS states, “In the event that treatment consists of either mating disruption pheromone flakes (aerial application), or ground treatment of isolated trees with Btk (*Bacillus thuringiensis kurstaki*), treatment effects are likely to be insignificant” (Appendix C – U.S. Fish and Wildlife Service letter). Therefore, no effects on nontarget organisms are anticipated from the proposed Disrupt II application.

Most ingredients in the flakes are insoluble in water, so the risk of disparlure leaching into groundwater is minimal. To determine the amount of disparlure that could potentially leach into water, 50 grams of flakes were submerged in 150 ml of water and vigorously agitated for 24 hours. Results indicate that less than 0.04% of the active ingredient (disparlure) contained in the flakes leached into water under these conditions (Thorpe et al 2006). Disrupt II is applied at doses of 6 or 15 grams of active ingredient (disparlure) per acre and 90% of the flakes are intercepted by and adhere to the forest canopy, where they remain until they have released most of the disparlure (Thorpe *et al.* 2006).

Using pheromone flakes to disrupt mating is likely to maintain the forest condition in the short-term by eliminating the gypsy moth population in the proposed treatment site, thus delaying the spread of gypsy

moths and reducing defoliation. In the long-term, gypsy moth will eventually become established in this county; even if this alternative is implemented.

### Regional Forester Sensitive Species

The specificity of this treatment suggests that any effects to vertebrates, terrestrial invertebrates, or plants designated as Regional Forester's sensitive species would likely be undetectable.

This treatment delivers the pheromones using plastics and food-grade adhesives deposited over the proposed treatment site. There is a lack of information regarding the potential effects of these elements to karst environments. It cannot be assumed that these species are resilient to disturbance based on prior disturbances, such as fire or flood. Current populations may be remnants of larger past populations following past agricultural practices and the clearing, burning, and development that occurred with early settlement (Parker and Ruffner 2004).

Given the unknowns relating to effects on cave and karst species, the following are possible site-specific mitigation methods:

- Alternatives 2 and 4: To reduce the likelihood of plastic flakes entering the cave systems exclude the karst area from treatment with pheromone flakes in 2008 and conduct mass trapping in the areas.
- Alternatives 2 and 4: If pheromone flakes are used in the karst area apply flakes that have no glue. This would reduce the chance of cave species ingesting any flakes that might enter a cave.

However, the potential for a flake to reach the forest floor is very small (Day 2007). The *Specialist Report: An Analogy of a Flake and a Raindrop* (Day 2007), went on to say that if a flake did make it through the forest canopy in a rain event, it is highly likely that the flake would be intercepted by the hardwood litter rather than being washed in to a cave or karst feature. The glue added to the flakes facilitated sticking to the canopy and other items as opposed to a simple raindrop where the wetting reduces the friction. Even in open conditions, the number of flakes that might actually enter a cave or karst feature is extremely small. In reviewing the size of the cave openings, an estimate of 40 flakes has the potential to directly enter the eight caves in open conditions (Day 2008). All caves are in forested conditions so there is a high probability that the leaves, twigs, and branches will intercept the flakes and the glue on the flakes will also facilitate the interception. Even at a 90% interception rate, there is a possibility of four flakes entering a cave.

In summary, pheromone flake application with the glue sticker is recommended for the karst area. The reason includes: 1) known impacts of increasing gypsy moth populations that would arise from not treating, 2) very limited number of flakes estimated to possibly enter the karst feature from this application, and 3) potential effects to karst species are unknown. Monitoring the flakes in the karst area during and after application is suggested.

### Management Indicator Species

Assuming that treatment to disrupt mating of caterpillars is effective, no habitat would be altered. Therefore, there would be no effects.

## Recreation and Wilderness

Assuming that treatment to disrupt mating and eradicate caterpillars is effective, no habitat would be altered. Effects from application of this alternative include additional amounts of plastic added into the Charles C. Deam Wilderness. Approximately 155 pounds of plastic flakes would be spread over 1,050 acres amounting to approximately 2 flakes for every square foot. The small size and green color of the flakes makes it unlikely that the flakes would alter the visual setting for many users. Application of this alternative would control the population of gypsy moth in the proposed treatment site resulting in the character remaining unchanged much as it is today. Short-term impacts to users would occur from low-flying aircraft on the day of application. It is expected that application would take approximately 2 hours and begin as soon as it is light enough to fly (approximately 0600 hours). The wilderness does not have many over-night users that would be affected by the project implementation. Application would also likely occur on a weekday when use of the area is even more limited.

Mating disruption is specific to the gypsy moth and thus would have no adverse impact on non-target species in the wilderness. Disparlure, the sex pheromone produced by the female gypsy moth to attract the male for mating, is synthesized and used as the active ingredient in Disrupt II. It is a natural component of any area that is infested with gypsy moth; however, it would be applied in higher concentrations than would occur naturally. The pheromone would dissipate over the summer following the application. Effects are expected to be the same on lands both in the wilderness and outside of it.

### **Alternative 3 - Btk**

Btk can have direct and indirect effects on nontarget organisms. Direct toxicity of Btk is generally limited to the larval stage of moth and butterfly species. Btk is not toxic to vertebrates, honeybees, parasitic and predatory insects, and most aquatic invertebrates (USDA 1995, Vol. IV, p. 5-1). Btk has a direct adverse effect on caterpillars of moths and butterflies, but susceptibility varies widely among species. Btk, as used in gypsy moth projects, poses a risk to some spring-feeding caterpillars; however, permanent changes in their populations do not appear likely. An exception may occur in certain habitats that support small isolated populations of a particular species of moth or butterfly that is highly susceptible to Btk (USDA 1995, Vol. II, p. 4-54).

Btk may have an indirect effect on other organisms by a reduction in their food resource (e.g. caterpillars, pupae, or adult moths and butterflies). Any effects on vertebrates due to reduction in food availability are probably subtle, especially for mammals and birds that are very mobile. Populations of some gypsy moth parasites and some general lepidopteran parasites may be reduced, due to the reduction in number of potential hosts caused by the Btk spray (USDA 1995, Vol. IV, p. 5-7). The U.S. Fish and Wildlife Service considers the project area to be utilized by the Indiana bat (*Myotis sodalis*). USFWS states, "In the event that treatment consists of either mating disruption pheromone flakes (aerial application), or ground treatment of isolated trees with Btk (*Bacillus thuringiensis kurstaki*), treatment effects are likely to be insignificant (Appendix C – U.S. Fish and Wildlife Service letter). Applications of Btk formulations do not increase levels of Btk in soil, and Btk persists for a relatively short time in the environment. Changes in soil productivity and fertility are not likely in the proposed treatment site, because Btk occurs naturally in soils worldwide. Additional information concerning the effects to soil can be found in Appendix G of the FEIS (USDA 1995, Vol. IV).

### Regional Forester Sensitive Species

Applications would treat either individual trees by ground spraying or larger landscape areas by aerial application. Application of Btk to individual trees would result in no effects to Regional Forester sensitive species. This method of treatment would limit exposure of RFSS to the bacterium.

Aerial broadcasting of Btk would result in exposure to some RFSS particularly, karst-associated invertebrates and the West Virginia white butterfly (*Pieris virginiensis*). Btk is non-toxic to vertebrates, specifically those species with acid-based, as opposed to alkaline, digestive systems (Thorpe *et al.* 2006). However, no data is available suggesting non-toxicity to subterranean invertebrates. Even though Btk is a naturally occurring soil bacterium, the occurrence of this bacterium in Midwest karst systems is unknown. That is, it is unknown if extant karst invertebrates have been previously exposed to this bacterium, or exposed at proposed application rates. Consequently, there is little information to suggest that karst invertebrates have adapted to or may tolerate exposure to this organism.

The West Virginia white butterfly occurs in proximity to the project area (Bess 2005, 2004). This lepidopteran species is susceptible to Btk (NatureServe 2007). Gypsy moth and West Virginia white caterpillar emerge at similar times. Therefore, use of Btk would likely impact West Virginia white caterpillar in the proposed treatment site.

### Management Indicator Species

Assuming that treatment to eradicate caterpillars is effective, no habitat would be altered; therefore there would be no effects.

### Recreation and Wilderness

Short-term impacts to users would occur from low-flying aircraft on the day of application. It is expected that application would take approximately 2 hours and begin as soon as it is light enough to fly (approximately 0600 hours). The wilderness does not have many over-night users that would be affected by the project implementation. Application would also likely occur on a weekday when use of the area is even more limited.

Application of Btk is likely to maintain the forest condition in the short-term by eliminating the gypsy moth population in the proposed treatment site, thus delaying gypsy moth from expanding and causing defoliation. In the long-term, gypsy moth will eventually become established in this county; even if this alternative is implemented.

### **Alternative 4 – Btk and Mating Disruption**

Aerial applications of Btk and/or mating disruption would likely maintain the forest condition in the short term by eliminating gypsy moth populations from the proposed treatment site, resulting in a delay of tree defoliation and mortality.

### Regional Forester Sensitive Species

Effects of this alternative would be the same as described in Alternatives 2 and 3.

### Management Indicator Species

Effects of this alternative would be the same as described in Alternatives 2 and 3.

### Wilderness and Recreation

Effects of this alternative would be the same as described in Alternatives 2 and 3.

## **4.3 Economic and Political Impacts of Treatment vs. Non-Treatment (Issue 3).**

**Alternative 1 – No action.** If treatments were not applied, the likely result would be the implementation of a quarantine in Monroe County. Quarantine would regulate movement of firewood, logs, other timber products, mobile homes, recreational vehicles, trees, shrubs, Christmas trees, and outdoor household articles. This would create a financial impact to industries that deal with these products.

If current populations are not treated, they will continue to reproduce and grow in size. Defoliation would become noticeable in the future, but it would be difficult to predict exactly when noticeable defoliation would occur. Requests for federal assistance to suppress gypsy moth would be likely when defoliation occurs. Suppression projects are generally more expensive in total dollars than eradication projects because much larger areas are treated and because of the increased cost of the insecticides. The economic impact to state budgets would increase, as responsible agencies would need to administer and fund these suppression projects.

Following defoliation, negative financial impacts are likely to occur for recreational industries such as resorts and campgrounds. Gypsy moth treatment costs, tree mortality, and adverse human health effects could affect homeowners, private woodland owners, and forest-based industries.

**Alternatives 2 (Mating Disruption), 3 (Btk), and 4 (Btk and Mating Disruption).** If treatments are applied, regulatory action is not likely for this county during the next year and the impacts listed under Alternative 1 would be delayed.

## **4.4 Likelihood of Success of the Project (Issue 4).**

**Alternative 1 – No action.** Project objectives would not be met with this alternative. Gypsy moth would not be eliminated from the proposed treatment site, and its population would serve as a source for increased spread within the county and into surrounding counties. If these populations were allowed to increase and expand, gypsy moth could spread through the state in 10 years (Sharov *et al.* 2002).

**Alternative 2–Mating Disruption.** Project success is likely with this alternative. Mating disruption is effective at eliminating gypsy moth populations at very low levels.

**Alternative 3 - Btk.** Project success is likely with this alternative. Btk is effective at eliminating gypsy moth populations at low levels.

**Alternative 4 –Btk and Mating Disruption.** Project success is likely with this alternative. Both mating disruption and Btk can eliminate gypsy moth populations.

#### **4.5 Unavoidable Adverse Effects**

No unavoidable adverse effects were identified for the proposed project.

#### **4.6 Irreversible and Irretrievable Commitments of Resources**

An irreversible commitment of resources results in the permanent loss of: 1) nonrenewable resources, such as minerals or cultural resources; 2) resources that are renewable only over long periods of time, such as soil productivity; or 3) a species (extinction) (USDA 1995, Vol. II, p. 4-93). Except for Alternative 1, there is an irreversible commitment of labor, fossil fuel, and money spent on the project.

An irretrievable commitment is one in which a resource product or use is lost for a period of time while managing for another (USDA 1995, Vol. II, p. 4-93). For this project, no irretrievable commitments were identified.

#### **4.7 Cumulative Effects**

Cumulative effects are the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions, which collectively are significant.

Given that the proposed treatment is expected to have no effect to Federally threatened or endangered species or to management indicator species in the project area, there would be no cumulative effects on those species. Specific Regional Forester sensitive species could be exposed to cumulative effects depending on whether or not action is taken.

If Alternative 1 (No Action) is taken:

The distribution of karst-associated species within the proposed treatment site, in some cases, may be globally restricted to these previously identified sites. That is, some of these species may occur only within these sites or interconnected sites. Consequently, any impact to these systems attributable to an untreated infestation of the gypsy moth may contribute to cumulative impact to these species.

Both the butternut and Cerulean warbler are designated as G4 species (apparently globally secure) with respect to their current rounded global conservation rankings (NatureServe 2007). The gypsy moth is not listed as a range wide threat to either of these species (NatureServe 2007). Consequently, any impact to scattered individuals would likely be discountable with respect to the range wide stability or viability of these species.

If Alternatives 2(Mating disruption), 3(Btk) or 4(Mating disruption and Btk) are taken:

The same considerations relative to karst invertebrates presented above are equally applicable regarding the implementation of active treatment protocols (mating disruption, Btk, or both). Distribution of karst-associated species in the proposed treatment site may be restricted to previously identified sites. That is, some of these species may occur only within these sites or interconnected sites. Consequently, any impact to these systems may contribute to cumulative impact to these species.

The West Virginia white butterfly occurs in the Charles C. Deam Wilderness and would be susceptible to the use of Btk. Broadcast treatment of forests throughout the range of the West Virginia white butterfly, using Btk; have likely contributed to its population decline (Bess 2004, NatureServe 2007). Spot treatment of Btk to individual trees would result in no impact, resulting in no cumulative impact to this sensitive species. Broadcast application of Btk would cumulatively contribute to at least a temporary decline of this species.

#### **4.8 Mitigation and Monitoring**

The Cooperative Gypsy Moth Project will implement the following:

##### **Mitigation**

- News releases of the treatment and date will be given to local newspapers and radio/TV stations.
- Local safety authority will be notified by direct contact or phone calls.
- Employees of state and federal agencies monitoring the treatment will receive training on treatment methods to be able to answer questions from the public.
- Aircraft will be calibrated for accurate application of treatment material.
- Applications will be timed so the most susceptible gypsy moth stage is targeted.

##### **Monitoring**

- During the treatment, ground observers and/or aerial observers will monitor the application for accuracy within the project site perimeters, swath width and drift.
- Application information (e.g. swath widths, spray-on and spray-off, acres treated, and altitude) will be downloaded to an operations-base computer.
- The proposed treatment site will be monitored using gypsy moth traps to determine the effectiveness of the treatment.
- Weather will be monitored during treatment to assure accurate deposition of the treatment material.
- Flake fall through the canopy will be monitored to obtain data on flakes landing on the forest floor.

## 5.0 INTERDISCIPLINARY TEAM MEMBERS

JUDITH PEREZ – Land Management Planner. USDA Forest Service – Hoosier National Forest, Bedford Office

- Education: BS Forest Management
- Responsibilities: Co-Interdisciplinary Team Leader, document review and coordination

ANGELA RUST – Southwest Nursery Inspector and Compliance Officer. Indiana Department of Natural Resources, Division of Entomology and Plant Pathology, Tell City Field Office

- Education: BS Entomology
- Responsibilities: Co-Interdisciplinary Team Leader, document writer, document review and coordination

KENNETH G. DAY – Forest Supervisor. USDA Forest Service – Hoosier National Forest, Bedford Office

- Education: BS Forest Resources Management; MS Forestry
- Responsibilities: document reviewer and decision maker

PHILIP T. MARSHALL – Managing State Entomologist and Forest Health Specialist. Indiana Department of Natural Resources, Division of Entomology and Plant Pathology, Indianapolis Office

- Education: BA Pre-Forestry; MF Forest Entomology and Pathology
- Responsibilities: Co-developer of the proposed cooperative project; document reviewer and decision maker

DENNIS HAUGEN – Entomologist. USDA Forest Service, Northeastern Area State and Private Forestry, Forest Health Protection

- Education: BS Forestry and Entomology; MS Entomology; Ph.D. Entomology and Forest Biology
- Responsibilities: Co-developer of the proposed cooperative project and document reviewer

ANGIE KRIEGER – Heritage Resource Specialist/Forest Archaeologist. USDA Forest Service – Hoosier National Forest, Bedford Office

- Education: BA Anthropology
- Responsibilities: completed analysis and documentation related to heritage resources

CLARK McCREEDY - Wildlife Biologist. USDA Forest Service – Hoosier National Forest, Tell City Office

- Education: M.S. Wildlife Ecology; PhD Environmental Toxicology
- Responsibilities: prepared biological evaluations for Federally threatened and endangered species, Regional Forester's sensitive species, analysis related to management indicator species, and document reviewer.

CYNTHIA M. SANDENO – Wildlife Biologist/Forest Karst Coordinator. USDA Forest Service – Hoosier National Forest, Bedford Office

- Education: BS Environmental Science; MS Biology
- Responsibilities: provided input and analysis related to cave and karst resources.

ERIC SANDENO – Outdoor Recreation Planner/Wilderness Manager. USDA Forest Service – Hoosier National Forest, Bedford Office

- Education: B.S. Recreation Resources Management
- Responsibilities: prepared Minimum Requirements Decision Guide for Charles C. Deam Wilderness and document reviewer.

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## APPENDIX A – QUESTIONS AND COMMENTS FROM PUBLIC MEETING

Table A-1. Attendees at December 4, 2007 meeting.

ATTENDEE	CITY AND STATE
Jim and Julie Akard	Bloomington, Indiana
Jason Carnes	Bloomington, Indiana
Stacy Duke	Bloomington, Indiana
Burney Fischer	Bloomington, Indiana
Bill and Becky Freeman	Nashville, Indiana
Lee Huss	Bloomington, Indiana
Marc Lane	Bloomington, Indiana
Bob Myers	Seymour, Indiana
Amy Marie Travis	Heltonville, Indiana

### QUESTIONS AND ANSWERS FROM PUBLIC MEETING

**1. QUESTION:** How does mating disruption work?

**ANSWER:** The gypsy moth female pheromone or chemical scent is imbedded onto 1x3 mm plastic flakes and a food grade glue is used to make the flakes adhere to the forest canopy. The flakes are released by plane over the canopy of the trees. The flakes release so much pheromone into the air that the male moths cannot locate or isolate the female moths. Since the female moths cannot fly, reproduction is dependent on the male moths being able to find the females.

**2. QUESTION:** Why are plastic flakes used as the means of delivering the pheromone and not some kind of biodegradable material such as liquids or wood chips?

**ANSWER:** The plastic flakes are biodegradable, but it does take many years for them to degrade. The registered product being used is Disrupt II and it only works with the flakes. Currently, it is the only product available to use. There is a new product in experimental use that would deliver the pheromone in a liquid droplet form. It may be available in the future. We are not aware if any research is currently being done or not by the company who makes Disrupt II to see if other, more biodegradable products can be used.

**3. QUESTION:** Where was the location that gypsy moth came into the county from? Was it a campground?

**ANSWER:** We really don't know the answer to that question; however, it is likely that this population originated by someone bringing in gypsy moth on horse trailers. Most of our moth counts have been near the horse camp and trail areas.

**4. QUESTION:** Are there any campgrounds or other similar public use areas in the proposed treatment site?

**ANSWER:** Yes, there is a horse campground run by the Hoosier National Forest, as well as other recreational trails and private camping areas.

**5. QUESTION:** I have horses and they do graze. I am concerned and wondering about what kind of, if any, studies have been done on pheromone flakes and equines? What if horses or deer eat the flakes while grazing?

**ANSWER:** We are not aware of any specific studies that have been done on equines regarding health issues from eating flakes. This is a matter that we can research further for you and get back in contact with you on. Please make sure we have your contact information before you leave the meeting. The planes do only treat habitat area, so if there are fields or pastures the flakes will not be released over those areas. If the horses are in an area with a lot of combined habitat – then we would be releasing flakes over that area. We would be more than willing to notify you ahead of treatments so that you would have time to move your animals to a sheltered area.

**6. QUESTION:** You mentioned that the product was “secured” before it was put on the plane for treatment? Has there been a problem with people stealing the product? Is this product a security threat?

**ANSWER:** There have not been any problems with this product; however, we want to bring up the issue of security to ease the public’s mind regarding the issue of bio-terrorism. Since September 11th, there are greater concerns on these types of matters and we want the public to know we are taking precautions to make sure that the product is safeguarded against contamination. Maybe safeguarded would be a better choice of word than secured.

**7. QUESTION:** Where are the pheromone flakes made?

**ANSWER:** The company is Hercon and they are located in Pennsylvania. The flakes are made exclusively for the U.S. Forest Service.

**8. QUESTION:** Are we to assume that there are also gypsy moths outside of Monroe County in surrounding counties? I have an oak farm in Jackson County that I sell timber from and I am very concerned about how this would affect my business in the future.

**ANSWER:** Yes, we have caught moths in Jackson County and other surrounding counties in our 2007 trapping survey and previous surveys. Every county in Indiana is surveyed annually. Since 1998, there are only two counties in all of Indiana where we have never had a find of gypsy moth during our trapping history. That is in Dubois and Sullivan counties. We can determine by the number of moths found in the county, their distribution within the county and past trap catches whether or not a population is building and reproducing. Our numbers for Jackson County do not indicate that.

**9. QUESTION:** I noticed from the map of infested areas that the whole northeast part of the U.S. is considered infested. It was said that gypsy moth arrived to Massachusetts in 1869. I was under the impression that once gypsy moth infested an area, it moved on through. Is that not the case?

**ANSWER:** Once gypsy moth is established, it is there to stay. It cannot be eradicated. The key to gypsy moth management is prevention. People in long time infested areas such as the northeast U.S. will notice cycles. Cycles of years where populations will be higher, then lower. This is in large part due to the presence of natural pathogens and predators. The gypsy moth population must build to high levels in order to sustain these pathogens. Then, as the pathogen suppresses the population – the pathogen dies off to low levels. Then gradually the gypsy moth population builds back up and the cycle repeats.

**10. QUESTION:** Why does the DNR assume that there are no egg masses in the area? Why not use both treatments (Btk and pheromone flakes)?

**ANSWER:** We do believe that there are egg masses in the area; however, after extensive egg mass survey we cannot find them. Without having a more specific location as to where the egg masses might be, it would not likely be an effective treatment. In following guidelines of the Slow The Spread Program, Btk is not generally applied unless egg mass locations can be determined.

**11. QUESTION:** You mentioned that Btk was naturally occurring, why doesn't it naturally control gypsy moth?

**ANSWER:** Btk only naturally exists in the soil. In order for Btk to kill gypsy moth larvae, the larvae must consume the Btk. So Btk must be applied to tree foliage so the caterpillars will eat it.

**12. QUESTION:** How much does it cost to treat an area with pheromone flakes?

**ANSWER:** The cost last year was approximately \$15.22 per acre. The cost of the treatment is shared 50/50 by the IDNR and USFS.

**13. QUESTION:** How quickly does the female Gypsy moth lay eggs?

**ANSWER:** After mating, a female can begin laying an egg mass within a few days.

#### GENERAL COMMENTS FROM ATTENDEES AT PUBLIC MEETING

**1. COMMENT:** I used to live in Ontario and I know first hand the damage that gypsy moth can do. I would encourage you to do what needs to be done to stop this from being an infestation.

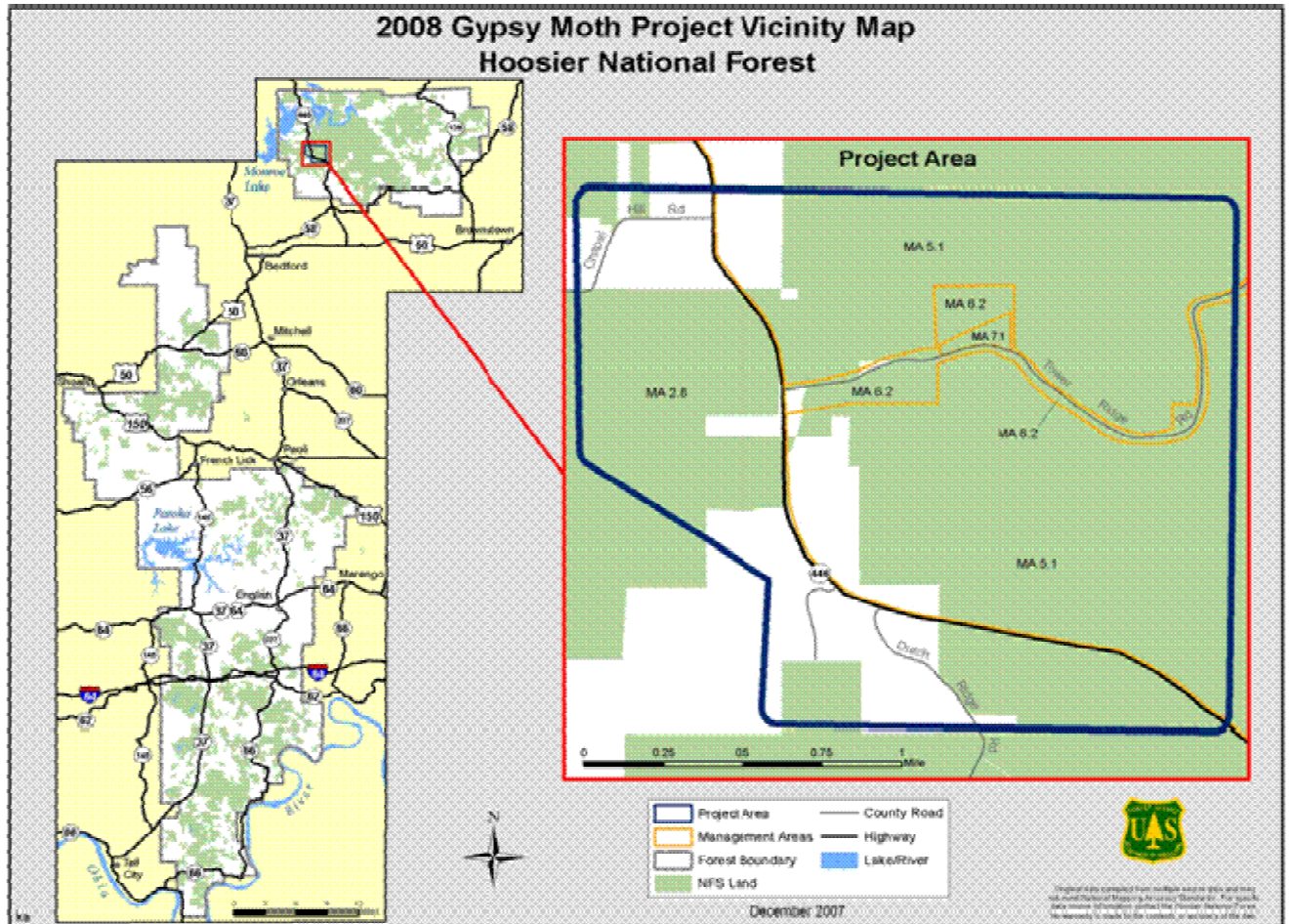
**2. COMMENT:** One attendee stated that the DNR and USFS would need to have proactive public relations and communications; otherwise, there could be a negative response to this proposal like there was in California during treatments for Lesser Brown moth. It was commented that there were concerns in that California situation regarding inert ingredients and general usage of any organic compounds. The attendee was supportive of a treatment, but wanted to address these possible issues that may arise.

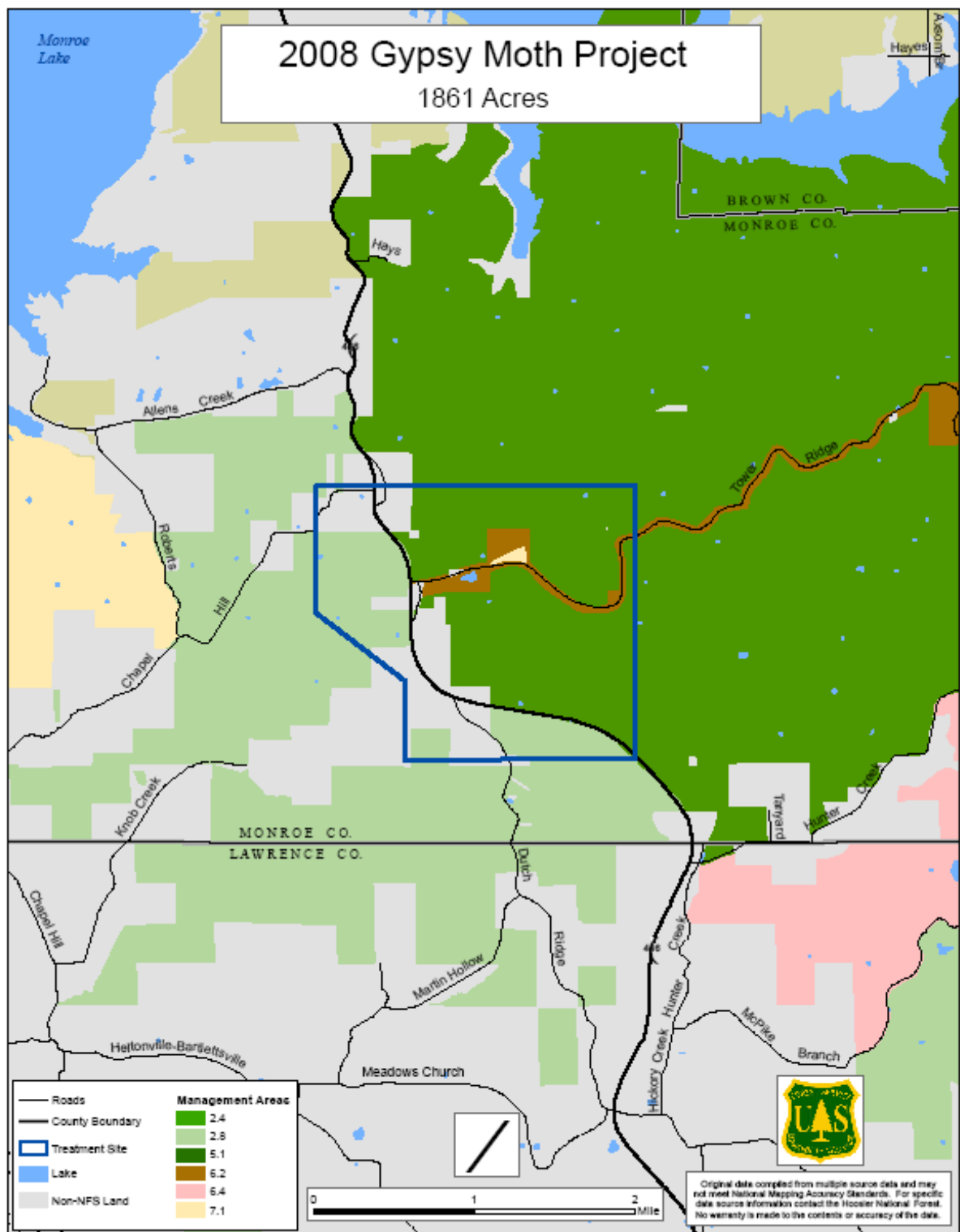
**RESPONSE:** Generally, we have a very good response from the public prior, during and after treatments. IDNR and the USFS will make every effort to get information out on the proposed treatment. Approximately 120 letters went out regarding this public meeting, with information enclosed regarding the proposed plan. A news release went out to about 350 locations and an article was published twice recently in the Hoosier Times. There will be a comment period after the public meeting for people to make additional comments. A few weeks prior to the treatment another round of letters will be sent out informing the recipients of the decided treatment and approximate time of occurrence. Two to three days prior to the treatment local news media and local emergency personnel are notified. IDNR and/or USFS staff will be available at the site during treatment.

#### COMMENTS RECEIVED AFTER PUBLIC MEETING

All comments received after the public meeting in response to the Proposed Action and Preliminary Alternatives for 30-day Notice and Comment 2008 Gypsy Moth Project are available for viewing at the Hoosier National Forest Office, 811 Constitution Ave., Bedford, Indiana 47421.

## APPENDIX B - MAPS OF PROPOSED TREATMENT SITE

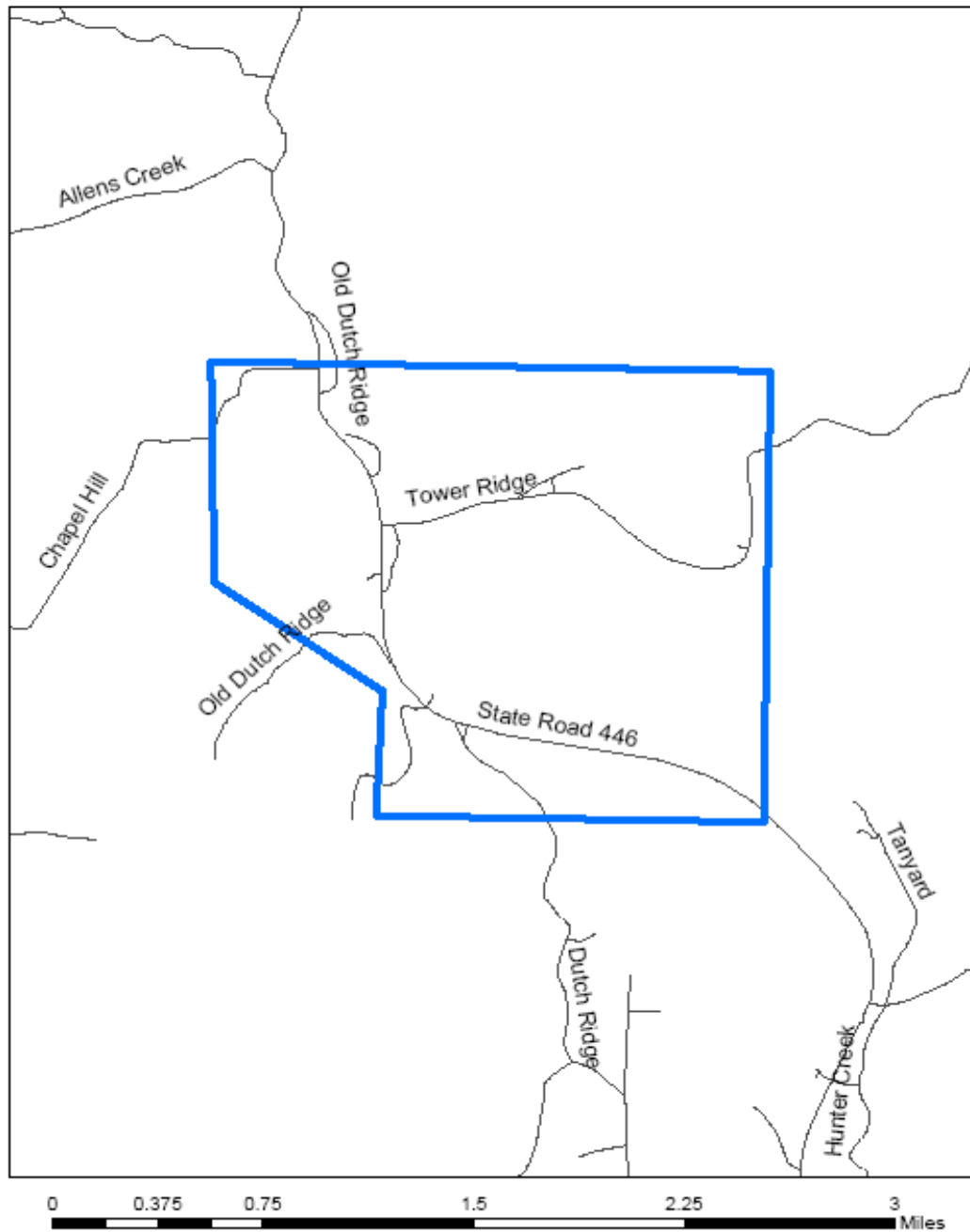




## 2008 Gypsy Moth Project

Hoosier National Forest

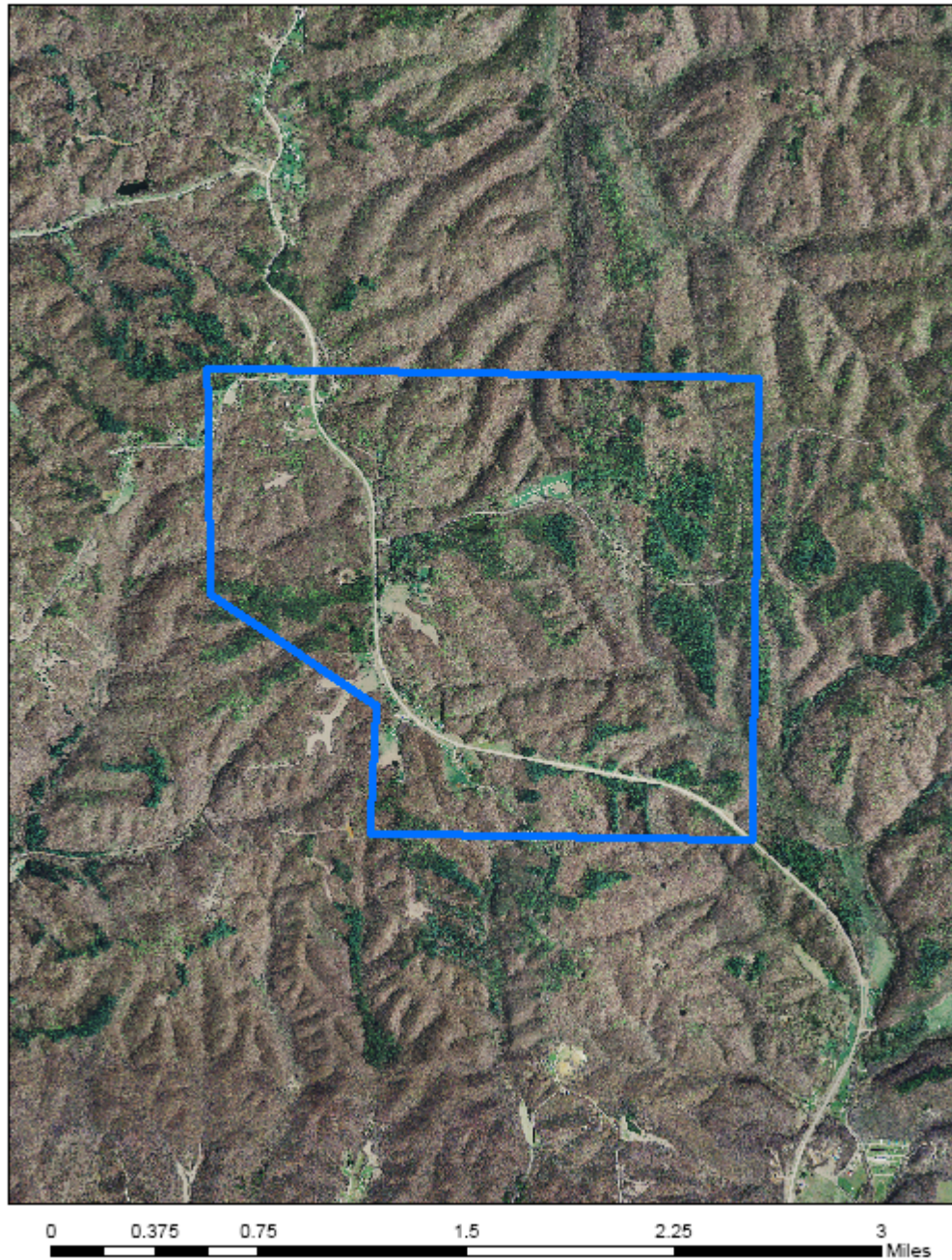
1,861 Acres



## 2008 Gypsy Moth Project

Hoosier National Forest

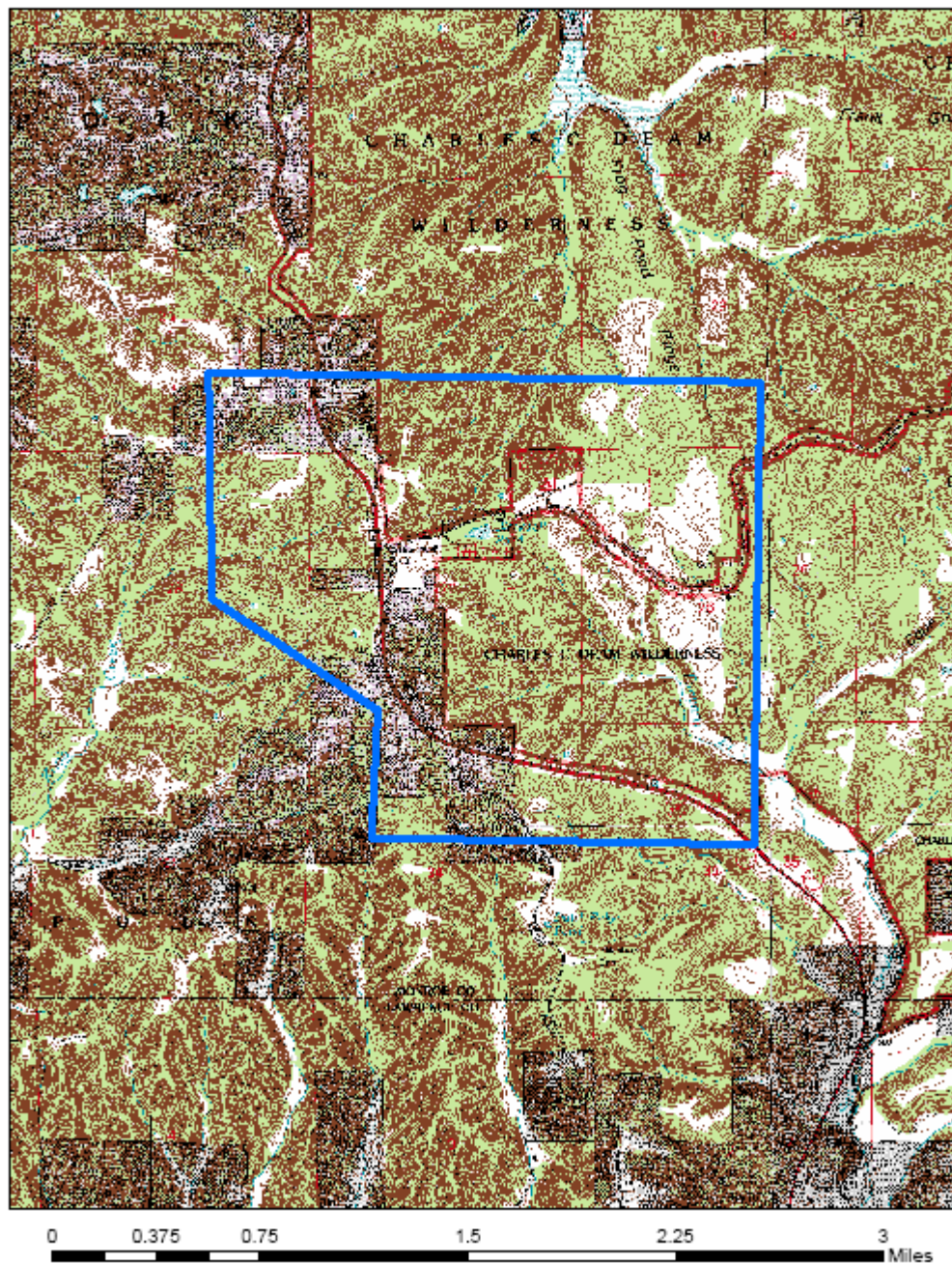
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# 2008 Gypsy Moth Project

Hoosier National Forest

1,861 Acres



## APPENDIX C – AGENCY LETTERS



Indiana Department of Natural Resources

Mitchell E. Daniels, Jr., Governor  
Robert E. Carter, Jr., Director

Division of Historic Preservation & Archaeology • 402 W. Washington Street, W274 • Indianapolis, IN 46204-2739  
Phone 317-232-1646 • Fax 317-232-0693 • [dhpa@dnr.IN.gov](mailto:dhpa@dnr.IN.gov)



December 6, 2007

Angie R. Krieger  
Heritage Resource Specialist  
U.S. Department of Agriculture, Forest Service  
Hoosier National Forest  
811 Constitution Avenue  
Bedford, Indiana 47421

Federal Agency: U.S. Forest Service ("USFS")

Re: Notification of the US Forest Service's finding of "no historic properties affected" regarding the gypsy moth eradication program for 2008 (DHPA #3254)

Dear Ms. Krieger:

Pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. § 470f) and 36 C.F.R. Part 800, the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has conducted an analysis of the materials dated November 30, 2007 and received on December 3, 2007, for the above indicated project in Hoosier National Forest, Monroe County, Indiana.

We see no reason to object to the USFS's November 30, 2007 finding that no historic properties within the area of potential effects will be affected by the above indicated project. However, we have noted that your identification and evaluation efforts have not been completely documented as specified in 36 C.F.R. § 800.11(d).

If you have not already done so, we recommend that you make complete documentation available to the public and all consulting parties for the above indicated project. We would welcome any additional documentation to be attached to the file. However, further coordination and comments from the Indiana SHPO will not be necessary.

If you have questions please contact Holly Tate at (317) 234-3919 or [htate@dnr.IN.gov](mailto:htate@dnr.IN.gov).

Very truly yours,

A handwritten signature in black ink, appearing to read "James A. Glass", with a long, sweeping horizontal line extending to the right.

James A. Glass, PhD  
Deputy State Historic Preservation Officer

JAG:HAT:hat

**THIS IS NOT A PERMIT**

**State of Indiana  
DEPARTMENT OF NATURAL RESOURCES  
Division of Water**

**Early Coordination/Environmental Assessment**

**DNR #:** ER-13067 **Request Received:** November 15, 2007

**Requestor:** \*Indiana Department of Natural Resources  
Phil Marshall  
Division of Entomology & Plant Pathology  
402 West Washington Street, Room W290  
Indianapolis, IN 46204

**Project:** 2008 Proposed Gypsy Moth Treatment Site; pheromone flakes only

**County/Site info:** Monroe

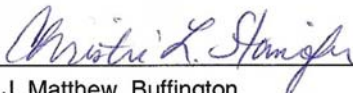
The Indiana Department of Natural Resources has reviewed the above referenced project per your request. Our agency offers the following comments for your information and in accordance with the National Environmental Policy Act of 1969.

**Regulatory Assessment:** Formal approval by the Department of Natural Resources under the regulatory programs administered by the Division of Water is not required for this project.

**Natural Heritage Database:** The Natural Heritage Program's data have been checked. There are a number of listed plant and bird species that have been recorded at or near the project site; however, the project should have minimal impacts to these species. Given that the Deam Wilderness is a large natural forest system, we support the use of pheromone flakes for gypsy moth control because there is undoubtedly a very diverse lepidopteran fauna present at the site that would be impacted using other methods.

**Fish & Wildlife Comments:** Controlling the spread of the gypsy moth is important to reduce the negative effects the caterpillars have on trees, particularly oaks. At this time, no harm to state or federal listed species resulting from the proposed mating disruption measures is known or anticipated. Fish, wildlife, and botanical resource losses as a result of this project should be minimal.

**Contact Staff:** Christie L. Stanifer, Environ. Coordinator, Environmental Unit  
Our agency appreciates this opportunity to be of service. Please do not hesitate to contact the above staff member at (317) 232-4160 or 1-877-928-3755 (toll free) if we can be of further assistance.

for   
J. Matthew Buffington  
Environmental Supervisor  
Division of Fish and Wildlife

**Date:** December 20, 2007



Indiana Department of Natural Resources

Division of Historic Preservation & Archaeology • 402 W. Washington Street, W274 • Indianapolis, IN 46204-2739  
Phone 317-232-1646 • Fax 317-232-0693 • dhpa@dnr.IN.gov

Mitchell E. Daniels, Jr., Governor  
Robert E. Carter, Jr., Director



November 26, 2007

Philip T. Marshall  
Indiana Department of Natural Resources  
Division of Entomology and Plant Pathology  
402 West Washington Street, Room W290  
Indianapolis, Indiana 46204

Federal Agency: U.S. Department of Agriculture, Forest Service

State Agency: Indiana Department of Natural Resources, Division of Entomology and Plant Pathology

Re: Gypsy moth eradication program for 2008 (DHPA #3254)

Dear Mr. Marshall:

Pursuant to Indiana Code 14-21-1-18 the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology ("DHPA") has conducted an analysis of the materials provided with your letter dated and received by the DHPA on November 14, 2007, for the above indicated project in Hoosier National Forest, Monroe County, Indiana. Pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. § 470f) and 36 C.F.R. Part 800, the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has conducted an analysis for the above indicated project.

**Refer to the following comments provided pursuant to Indiana Code 14-21-1-18:**

We are not aware of any architectural sites or structures within the project area that are listed in the National Register of Historic Places, the Indiana Register of Historic Sites and Structures, or that might otherwise be considered historic as the term is used in Indiana Code 14-21-1-18.

In conclusion, it appears to us, based on what we currently know, that a certificate of approval will not be necessary for alterations to any known, historically or architecturally significant structures or sites.

**Refer to the following comments provided pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. § 470f) and 36 C.F.R. Part 800:**

Based upon the documentation available at Indiana SHPO, we have not identified any historic buildings, structures, districts, objects, or archaeological resources listed in or eligible for inclusion in the National Register within the probable area of potential effects.

This information has been provided to assist the U.S. Department of Agriculture, Forest Service with the identification of historic properties. Upon completion of the remainder of its identification and evaluation efforts in 36 C.F.R. § 800.4 (a-c), the U.S. Department of Agriculture, Forest Service may analyze the information that has been gathered and proceed to consider the effects on historic properties. Thereafter, the U.S. Department of Agriculture, Forest Service will need to notify the Indiana SHPO and other appropriate parties of the results of its identification and evaluation efforts and its views on whether historic properties may or may not be affected with the appropriate documentation as stated in 36 C.F.R. § 800.4(d). Please refer to the following comments:

- 1) If the U.S. Department of Agriculture, Forest Service believes that a determination of "no historic properties affected" accurately reflects its assessment, then it shall provide documentation of its finding as set forth in 36

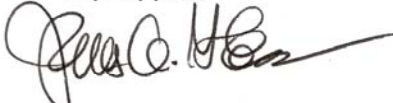
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C.F.R. § 800.11(d) to the Indiana SHPO, notify all consulting parties, and make the finding with supporting documentation available for public inspection (36 C.F.R. §§ 800.4[d][1] and 800.2[d][2]).

- 2) If, on the other hand, the U.S. Department of Agriculture, Forest Service finds that an historic property may be affected, then it shall notify the Indiana SHPO, the public and all consulting parties of its finding and seek views on effects in accordance with 36 C.F.R. §§ 800.4(d)(2) and 800.2(d)(2). Thereafter, the U.S. Department of Agriculture, Forest Service may proceed to apply the criteria of adverse effect and determine whether the project will result in a "no adverse effect" or an "adverse effect" in accordance with 36 C.F.R. § 800.5.

*A copy of the revised 36 C.F.R. Part 800 that went into effect on August 5, 2004 may be found on the Internet at [www.achp.gov](http://www.achp.gov) for your reference. If you have questions please contact Holly Tate at (317) 234-3919 or [htate@dnr.IN.gov](mailto:htate@dnr.IN.gov). Additionally, in all future correspondence regarding the above indicated project, please refer to DHPA #3254.*

Very truly yours,



James A. Glass, PhD  
Deputy State Historic Preservation Officer

JAG:HAT

cc: Judi Perez, Hoosier National Forest



United States Department of the Interior  
Fish and Wildlife Service



Bloomington Field Office (ES)  
620 South Walker Street  
Bloomington, IN 47403-2121  
Phone: (812) 334-4261 Fax: (812) 334-4273

January 11, 2008

Judi Perez  
USDA – United States Forest Service  
Hoosier National Forest Office  
811 Constitution Avenue  
Bedford, IN 47421

Ms. Perez:

In response to a letter received November 14, 2007 in this office (from Indiana Dept. of Natural Resources) regarding gypsy moth treatment sites within the Hoosier National Forest (HNF), the U.S. Fish and Wildlife Service (USFWS) has reviewed the details provided, including maps of the area. The letter specifically asked for information regarding threatened and endangered species in, or immediately near, the treatment sites.

The Bloomington Field Office (BFO) of the USFWS considers the treatment area to be utilized by the Indiana bat (*Myotis sodalis*).

Potential treatment effects (aerial application of mating disruptor – pheromone flakes) are unlikely to pose significant risk to highly mobile, solitary, male Indiana bats. However, if maternal colonies of the Indiana bat should occur in proximity to the treatment area, increased risk is more likely. In the event that treatment consists of either mating disruption pheromone flakes (aerial application), or ground-treatment of isolated trees with Btk (*Bacillus thuringiensis* kurstaki), treatment effects are likely to be insignificant. Prior to consideration of the aerial broadcasting of Btk, however, it is recommended that consultation with the USFWS be reinitiated.

Thank you for your inquiry. If you have any questions, please do not hesitate to contact BFO biologist Michael Tosick at (812)334-4261, ext. 218 ([michael\\_tosick@fws.gov](mailto:michael_tosick@fws.gov)).

Sincerely,

Scott Pruitt  
Field Supervisor  
U.S. Fish & Wildlife Service

CC: Philip Marshall (IDNR); Angela Rust (IDNR); Scott Kinzie (IDNR)

## APPENDIX D – EXAMPLES OF PRODUCT LABELS

SPECIMEN LABEL	UPDATES AVAILABLE AT WWW.GREENBOOK.NET 1				
<p><b>Valent BioSciences</b></p> <p><b>Foray® 76B</b></p> <p><b>Biological Insecticide</b></p> <p><b>Flowable Concentrate</b></p> <p><b>For the control of Lepidopterous Larvae</b></p> <p><b>ACTIVE INGREDIENT:</b>  <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>, strain            ABTS-351, fermentation solids and solubles ..... 18.44%            Other Ingredients: ..... 81.56%</p> <p><b>Total:</b> ..... 100.0%</p> <p><b>Potency:</b> 16,700 Cabbage Looper Units (CLU)/mg of product (equivalent to 76 billion CLU/GAL).</p> <p>The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.</p> <p>EPA Reg. No. 73049-49            EPA Est. No. 33762-1A-001 LIST NO. 60176</p> <p><b>KEEP OUT OF REACH OF CHILDREN</b></p> <p><b>CAUTION</b></p> <p><b>1.0 FIRST AID</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"><b>If on skin or clothing</b></td> <td> <ul style="list-style-type: none"> <li>Take off contaminated clothing.</li> <li>Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul> </td> </tr> <tr> <td><b>If in eyes</b></td> <td> <ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul> </td> </tr> </table> <p style="text-align: center;"><b>HOT LINE NUMBER</b></p> <p>Have the product container with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-315-9819 for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-323-9597.</p> <p><b>2.0 PRECAUTIONARY STATEMENTS</b></p> <p><b>2.1 HAZARDS TO HUMANS AND DOMESTIC ANIMALS</b></p> <p><b>CAUTION</b></p> <p>Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing. Wash thoroughly with soap and water after handling.</p> <p><b>2.2 Personal Protective Equipment (PPE)</b></p> <p>Applicators and other handlers must wear:</p> <ul style="list-style-type: none"> <li>Long-sleeved shirt</li> <li>Long pants</li> <li>Waterproof gloves</li> <li>Shoes plus socks</li> </ul> <p><b>2.3 Agricultural Use Requirements:</b></p> <p>Mixers/loaders and applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic reactions. When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.</p> <p><b>2.4 Non-Agricultural Use Requirements:</b></p> <p>Mixer/loaders and applicators not in enclosed cabs or aircraft must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.</p> <p><b>2.5 User Safety Recommendations</b></p> <p>Users should:</p> <ul style="list-style-type: none"> <li>Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.</li> <li>Remove clothing immediately if pesticide gets inside. Wash thoroughly and put on clean clothing.</li> <li>Remove PPE immediately after handling the product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.</li> </ul> <p><b>2.6 Environmental Hazards</b></p> <p>For terrestrial agricultural uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.</p> <p>Database and format copyright © by Vance Communication Corp. All rights reserved.</p>	<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>Take off contaminated clothing.</li> <li>Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>	<b>If in eyes</b>	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>	<p>Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.</p> <p><b>3.0 STORAGE AND DISPOSAL</b></p> <p>Do not contaminate water, food or feed by storage or disposal of waste.</p> <p><b>Storage:</b> Store in a cool, dry place. Keep containers tightly closed when not in use. Store in temperatures above freezing and below 25°C (77°F).</p> <p><b>Pesticide Disposal:</b> Pesticide waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility in accordance with federal and local regulations.</p> <p><b>Container Disposal:</b> Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.</p> <p><b>4.0 DIRECTIONS FOR USE</b></p> <p>It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.</p> <p>Do not apply this product through any type of irrigation system.</p> <p><b>5.0 AGRICULTURAL USE REQUIREMENTS</b></p> <p>Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.</p> <p>Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.</p> <p>Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.</p> <p>PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:</p> <ul style="list-style-type: none"> <li>Coveralls</li> <li>Waterproof gloves</li> <li>Shoes plus socks</li> </ul> <p><b>6.0 APPLICATION</b></p> <p>Foray 76B may be applied by ground or aerial equipment undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather, spray equipment, and local experience.</p> <p>Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower/treatment coordinator are responsible for considering all of these factors when making decisions.</p> <p><b>7.0 MIXING</b></p> <p>Shake or stir Foray 76B before use. Fill spray or mixing tank half full of water. Begin agitation and pour Foray 76B into water while maintaining continuous agitation. Add other spray material (if any) and balance of water. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.</p> <p>The use of a spreader-sticker approved for use on growing crops is recommended for hard to wet crops such as cole crops or to improve weather-fastness of the spray deposits. Combinations with commonly used spray tank adjuvants are generally not deleterious to Foray 76B, if the mix is used promptly. Before mixing in the spray tank, it is advisable to test physical compatibility by mixing all components in a small container in proportionate quantities.</p> <p><b>8.0 SPRAY VOLUMES</b></p> <p><b>Ground Application:</b> Use recommended amount of Foray 76B in ground equipment with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather conditions, spray equipment used and local experience.</p> <p><b>Aerial Application:</b> Use recommended amount of Foray 76B in aerial equipment undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. In the western US 5-10 gallons per acre is the normal minimum; in the eastern regions a minimum of 2-3 gallons is normally used. The minimum amount of water needed per acre will depend upon crop size, weather conditions, spray equipment used and local experience.</p> <p><b>9.0 GENERAL AGRICULTURAL USE INSTRUCTIONS</b></p> <p>Foray 76B is a biological insecticide for the control of lepidopterous larvae. It contains the spores and endotoxin crystals of <i>Bacillus thuringiensis kurstaki</i>. Foray 76B must be ingested by the larvae to be effective. For consistent control, apply at first sign of newly hatched larvae (1st and 2nd instar larvae). Susceptible larvae that ingest Foray 76B cease feeding within a few hours and die within 2-5 days.</p>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>Take off contaminated clothing.</li> <li>Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>				
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>				

## SPECIMEN LABEL

UPDATES AVAILABLE AT WWW.GREENBOOK.NET 2

Foray 76B may be applied up to and on the day of harvest.

For maximum effectiveness the following is recommended:  
Monitor fields to detect early infestations.

Apply Foray 76B when eggs start hatching and larvae are small (early instars) and before significant crop damage occurs. Larvae must be actively feeding to be affected.

Repeat applications every 3 to 14 days to maintain control and protect new plant growth. Factors affecting spray interval include rate of plant growth, weather conditions, and reinfestations. Monitor populations of pests and beneficials to determine proper timing of applications.

Under conditions of heavy pest pressures or when large worms are present use the higher rate, shorten the application interval, and/or improve spray coverage to enhance control. When these conditions are present, a contact insecticide should be used to enhance control.

Thorough coverage is essential for optimum performance. Ground applicators equipped with directed drop nozzles can improve coverage.

10.0 Table 1.

Crop	Pets	Rate <sup>1</sup> (oz./acre)	Dosage <sup>1</sup> (BIU/acre)
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Ornamental Fruit, Nut & Citrus Trees <sup>2</sup>	Gypsy Moth Elm Spanworm	13.5-67.5	8-40
	Spruce Budworm Brownail Moth Douglas Fir Tussock Moth Coneworm Buck Moth	13.5-50.5	8-30
	Tussock Moth Pine Butterfly Bagworm Leafroller Tortrix Mimosa Webworm Tent Caterpillar Jackpine Budworm Blackheaded Budworm Saddled Prominent Saddleback Caterpillar Eastern & Western Hemlock Looper Orangestriped Oakworm Satin Moth	10.0-27.0	6-16
	Redhumped Caterpillar Spring & Fall Cankworm California Oakworm Fall Webworm	7.0-13.5	4-8

## Special Instructions

<sup>1</sup>Use the higher recommended rates on advanced larval stages or under high density larval populations.

<sup>2</sup>In treating gypsy moth infested trees and shrubs in urban, rural, and semi-rural areas, exposure of non-target vegetation including, but not limited to, native and ornamental species and food or feed crops is permitted.

## 11.0 DIRECTIONS FOR USE FOR NON-AGRICULTURAL APPLICATIONS

## 11.1 NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep unprotected persons out of the treated areas until sprays have dried.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower/treatment coordinator are responsible for considering all of these factors when making decisions.

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climatic modification and being grown in interior landscapes, ornamental gardens or parks, or on golf courses or lawns and grounds.

Not for use on trees being grown for sale or other commercial use, or for commercial seed production, or for the production of timber or wood products, or for research purposes except for wide-area public pest control programs sponsored by government entities, such as mosquito abatement, gypsy moth control, and Mediterranean fruit fly eradication.

Do not apply this product through any type of irrigation system.

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Foray 76B contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 76B is a stomach poison and is effective against lepidopterous larvae. After ingestion, larvae stop feeding within hours and die 2-5 days later. Maximum activity is exhibited against early instar larvae. Foray 76B may be used for both ground and aerial application. The product should be shaken or stirred before use. Add some water to the tank mix, pour the recommended amount of Foray 76B into the tank and then add the remaining amount of water to obtain the proper mix ratio. Agitate as necessary to maintain the suspension. The diluted mix should be used within 72 hours.

## 11.2 Ground Application:

Use an adequate amount of tank mix to obtain thorough coverage without excessive run off. Use the recommended per acre dosages of Foray 76B in up to the following amounts of water:

High volume hydraulic sprayers	100 gallons
Mist blowers	10 gallons

## 11.3 Aerial Application:

Foray 76B may be applied aerially, either alone or diluted with water at the dosages shown in the application rates table. Spray volumes of 28-128 ounces per acre are recommended. Best results are expected when Foray 76B is applied to dry foliage.

12.0 Table 2.

Crop	Pets	Rate <sup>1</sup> (oz./acre)	Dosage <sup>1</sup> (BIU/acre)
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Ornamental Fruit, Nut & Citrus Trees <sup>2</sup>	Gypsy Moth Elm Spanworm	13.5-67.5	8-40
	Spruce Budworm Brownail Moth Douglas Fir Tussock Moth Coneworm Buck Moth	13.5-50.5	8-30
	Tussock Moth Pine Butterfly Bagworm Leafrollers Tortrix Mimosa Webworm Tent Caterpillar Jackpine Budworm Blackheaded Budworm Saddled Prominent Saddleback Caterpillar Eastern & Western Hemlock Looper Orangestriped Oakworm Satin Moth	10.0-27.0	6-16
	Redhumped Caterpillar Spring & Fall Cankworm California Oakworm Fall Webworm	7.0-13.5	4-8

## Special Instructions

<sup>1</sup>Use the higher recommended rates on advanced larval stages or under high density larval populations.

<sup>2</sup>In treating gypsy moth infested trees and shrubs in urban, rural, and semi-rural areas, exposure of non-target vegetation including, but not limited to, native and ornamental species and food or feed crops is permitted.

## 13.0 NOTICE OF WARRANTY

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE CONCERNING THE USE OF THIS PRODUCT OTHER THAN AS INDICATED ON THE LABEL. USER ASSUMES ALL RISK OF USE, STORAGE OR HANDLING NOT IN STRICT ACCORDANCE WITH ACCOMPANYING DIRECTIONS.

VALENT BIOSCIENCES® CORPORATION

870 Technology Way  
Libertyville, IL 60048—800-323-9597  
04-4416/R3

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VID 5.5.04

**HERCON<sup>®</sup>**  
**DISRUPT<sup>®</sup> II**  
**GYPSY MOTH MATING DISRUPTANT**

Population Suppressant

HERCON DISRUPT II<sup>®</sup> Gypsy Moth is a controlled-release pheromone formulation designed to lower incidence of gypsy moth, *Lymantria dispar*, mating by disrupting normal male flight orientation to females. This reduction in mating will help suppress the larval (caterpillar) population that causes damage by feeding on the leaves of hardwoods and evergreens.

**ACTIVE INGREDIENTS:**

(Z)-7,8-epoxy-2-methyloctadecane...	17.9 %*
OTHER INGREDIENTS .....	82.1 %
<b>TOTAL .....</b>	<b>100.0 %</b>

**CONTENTS:**

**MINIMUM NET WEIGHT:** Kg | lb)\*

\* 8.5 kg (18.7 lb) of product will treat 50 acres at 30.4 g A.I./acre

**KEEP OUT OF REACH OF CHILDREN**  
**C A U T I O N**

Read Directions and Precautionary Statements Before Use

**FIRST AID:**

**Have the product container or label with you when calling a poison control center or doctor or going for treatment**

**IF SWALLOWED:**

- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow
- Do not induce vomiting unless told to by a poison control center or doctor.
- Do not give anything to an unconscious person

**IF IN EYES:**

- Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes. Then continue rinsing.
- Call a poison control center or doctor immediately for treatment advice

**IF ON SKIN:**

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor immediately for treatment advice.

**IF INHALED:**

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor immediately for further treatment advice.

**Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact the National Pesticide Telecommunications Network at 1-800-858-7378 for emergency medical treatment information. Hours of operation are seven days a week 6:30 am to 4:30 pm PST.**

**HERCON<sup>®</sup> DISRUPT II GYPSY MOTH**  
**PRECAUTIONARY STATEMENTS**

**Hazards to Humans and Domestic Animals**

**CAUTION:** Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes and mouth. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco products or using the toilet. Applicators and other handlers must wear long-sleeved shirt and long pants, waterproof gloves and shoes plus socks.

**ENVIRONMENTAL HAZARDS:** For terrestrial uses: Do not apply directly to water or to areas where surface water is present nor to intertidal areas below the mean high water mark, except under forest canopy. Do not contaminate water when disposing of equipment washwaters or rinsate.

**DIRECTIONS FOR USE**

**It is a violation of Federal law to use this product in a manner inconsistent with its labeling.**

Apply this product up to two weeks before adult gypsy moth emergence. Depending on the gypsy moth population densities apply 30 gm (170 gm (6 oz) of product), 15 gm (85 gm (3 oz) of product) or 6 gm (34 gm (1.2 oz) of product) of active ingredient per application per acre. Apply 15 gm and 6 gm of active ingredient in low density gypsy moth populations. Consult your state or local authorities for determining gypsy moth population levels in your area. **To ensure proper rate and method of application, make application by or under the supervision of qualified a person.**

Apply a second application if adult gypsy moth emergence is extended or delayed, otherwise one application lasts the entire season. Use an inert sticker material with DISRUPT II to hold flakes on treated foliage or plant parts. The Hercon applicator is specifically designed to mix the proper amount of DISRUPT II flakes and inert sticker at the time of application. Use in areas such as forest, residential, municipal and shade tree area, recreational area such as campgrounds, golf courses, parks and parkways, ornamental, shade tree forest plantings, shelter belts and rights of way and other easements.

**STORAGE AND DISPOSAL:**

Do not contaminate water, food, or feed by storage and disposal  
**PESTICIDE STORAGE:** Store in sealed containers in a cool dry place.

**PESTICIDE DISPOSAL:** Waste resulting from this product may be discarded in an approved landfill.

**CONTAINER DISPOSAL:** Do not reuse empty bags. Place empty bags in trash

**NOTICE:** Hercon Environmental warrants that this material conforms to the chemical description on the label. Manufacturer neither makes nor authorizes any agent or representative to make any other warranty of fitness or of merchantability, guarantee or representation expressed or implied, concerning this material. Manufacturer's maximum liability for breach of this warranty shall not exceed the purchase price of this product.

Made in the USA by

**HERCON ENVIRONMENTAL**  
Emigsville, PA 17318-0435 EPA Reg. No. 8730-55 EPA Est. No. 8730-PA-01  
Questions? Call 1-866-4-HERCON  
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REV 040705

## APPENDIX E – MINIMUM REQUIREMENTS DECISION GUIDE



ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

# MINIMUM REQUIREMENTS DECISION GUIDE WORKSHEETS

*“ . . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”*

– The Wilderness Act, 1964

### Step 1: Determine if it is necessary to take action.

**Description:** Briefly describe the situation that may prompt action.

Since its introduction into the United States in 1869, the gypsy moth (*Lymantria dispar*) has defoliated thousands of acres of hardwood forests across the Northeastern United States. Originally introduced into Massachusetts, the gypsy moth has slowly spread north to Maine and south to North Carolina, infesting 19 States and the District of Columbia. Despite state and local control efforts, the infestation continues to move south and west (USDA APHIS 2003).

Based on data collected in the last several years through the use of pheromone traps, gypsy moth has been detected in south central Indiana (Monroe County). In an effort to eradicate gypsy moth, one (1) block which includes national forest has been proposed for treatment with mating disruption in 2008 to eradicate gypsy moth.

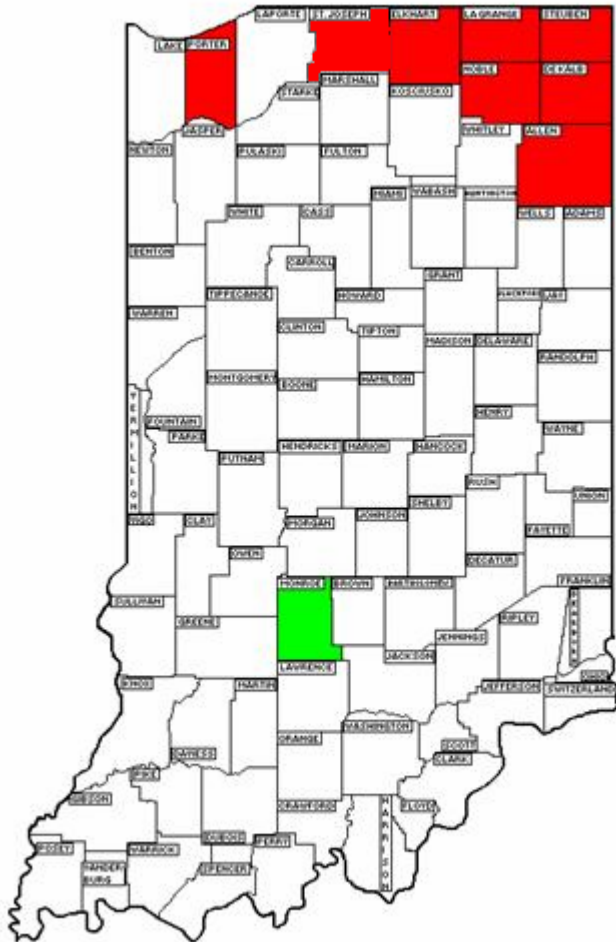
The Hoosier National Forest, Indiana Department of Natural Resources (IDNR), Division of Entomology & Plant Pathology and Division of Forestry, and US Forest Service State and Private Forestry will work cooperatively on this project.

Gypsy moth is not native to the United States, and it lacks effective natural controls. The caterpillars feed on the foliage of many host plants. Oaks are the preferred host species, but the caterpillars defoliate many species of trees and shrubs when oaks are not available. When high numbers of Gypsy Moth caterpillars are present, forests and trees suffer severe defoliation, which can result in reduced tree growth, branch dieback and even tree mortality. The high numbers of caterpillars also create a substantial public nuisance and can affect human health.

The objective for this cooperative project is to eradicate Gypsy moth by eliminating reproducing populations from the proposed treatment site. The Gypsy moth population found in Monroe County is

well in advance of areas generally infested with gypsy moth and has the potential for rapid population increase. Figure 1 show counties in Indiana currently infested with gypsy moth and the distance Monroe County is from the infestation zone.

Figure 1 Gypsy Moth in Indiana



Red indicates infested counties.

Green indicates population found in Monroe County.

In 1992, the U.S. Department of Agriculture's (USDA) Forest Service (FS) and Animal and Plant Health Inspection Service (APHIS), along with the Department of Interior's National Park Service and eight state and university partners embarked on a pilot project called "Slow the Spread." The project's goal was to slow the rate of natural spread of the gypsy moth by using integrated pest management strategies (USDA APHIS 2003).

The project demonstrated that it is feasible to significantly reduce the spread of gypsy moth and that this can be accomplished in a cost-effective and environmentally viable manner using current technology.

In 1999, following successful completion of the pilot project, the National Gypsy Moth Slow the Spread (STS) program was implemented along the entire 1,200 mile gypsy moth frontier from North Carolina through the upper peninsula of Michigan.

For the proposed project on the Hoosier, private and national forest lands in the proposed treatment site totals 1,861 acres. Of the 1,861 acres proposed for treatment 1,050 acres fall within the boundaries of the Charles C. Deam Wilderness (CCDW). Table 1 shows a breakout of acres by ownership in the proposed project area.

Table 1

ACRES BY OWNERSHIP

Treatment Area by Ownership	Acres	Percent of Project
Private	326	18
National Forest Wilderness (CCDW)	1,050	56
National Forest, non Wilderness	485	26
<b>Total</b>	<b>1,861</b>	<b>100</b>

**A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation**

Are there valid existing rights or is there a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of action involving Section 4(c) uses? Cite law and section.

Yes: ☐ No: ☐ Not Applicable: ☒

**Explain:**

This project will not require a temporary road, use of motor vehicles, motorized equipment, landing of aircraft, structure installation, or any other form of mechanical transport. Proposed treatments in the action alternatives would be applied by airplane above the tree canopy or by backpack sprayers transported by non-mechanical methods.

Public Law 97-384 established the Charles C. Deam Wilderness in 1982. In Section 3 of this Act, it states that the right of access to privately owned cemeteries (Terrill Cemetery) would be protected. Terrill Cemetery is outside of the project boundary and will not be affected by this project.

**B. Describe Requirements of Other Legislation**

Do other laws require action?

Yes: ☐ No: ☒ Not Applicable: ☐

**Explain:**

This action is not required.

**C. Describe Other Guidance**

Does taking action conform to and implement relevant standards and guidelines and direction contained in agency policy, unit and wilderness management plans, species recovery plans, tribal government agreements, state and local government and interagency agreements?

Yes: ☒ No: ☐ Not Applicable: ☐

**Explain:**

Section 4(d)(1) of the Wilderness Act, allows insect and disease control. "...In addition, such measures may be taken as may be necessary in the control of fire, insects, and diseases..."

Forest Service Manual 2324.04b The Regional Forester can approve insect and disease control in wilderness if: a) There is an immediate threat of unacceptable damage to resources outside the wilderness boundary or of unnatural loss of the wilderness resource due to exotic pests, and b) The threat cannot reasonably be abated by control actions taken outside the wilderness boundary.

Forest Service Manual 2324.11. Control insect and plant disease epidemics that threaten adjacent lands or resources.

Hoosier National Forest Land and Resource Management Plan (2006) allows for control of insects and disease.

- Management Area 5.1 (guideline) - Use pesticides as necessary to prevent the loss of significant aspects of the wilderness, or to prevent significant losses to resource values on private or public lands bordering the wilderness (page 3-35).

The immediate threat is an unacceptable rate of spread into previously uninfested areas – in this case, surrounding national forest system land, state land, and private property in south central Indiana. The purpose of the proposed treatment is not to protect the wilderness from infestation by gypsy moth but to eradicate gypsy moth from this part of the state.

**D. Describe Options Outside of Wilderness**

Can this situation be resolved by action outside of wilderness?

Yes: ☐ No: ☒ Not Applicable: ☐

**Explain:**

Excluding the CCDW from treatment cannot be reasonably expected to eradicate gypsy moth from the proposed treatment site. The positive pheromone traps were either in the CCDW or along the wilderness boundary.

Without treatment, the spread of the gypsy moth can be up to 13 miles per year. Since females are not capable of flight, this spread can be attributed to natural movement such as hatching larvae “ballooning” short distances and accidental movement of life stages by humans (USDA FS 2003, Leonard *et al.*). Only treating areas outside wilderness will not eradicate gypsy moth from south central Indiana and would still allow for spread.

**E. Wilderness Character**

How would action contribute to the preservation of wilderness character, as described by the components listed below?

**Untrammelled:** Gypsy moth eradication is an insect control measure within a wilderness, this proposal would be a “trammeling” since it involves human influence or control over nature.

**Undeveloped:** Not Applicable

**Natural:** Since the gypsy moth is non-native to the wilderness, elimination of these populations would have a beneficial effect on the naturalness of the area.

**Outstanding opportunities for solitude or a primitive and unconfined type of recreation:** Low flying aircraft above the wilderness area the day of treatment would be noticeable (primarily sound) and would impact visitor’s sense of solitude and their primitive recreation experience and the feeling of remoteness.

**Other unique components that reflect the character of this wilderness:**

There are no unique components of the proposed treatment site.

**F. Describe Effects to the Public Purposes of Wilderness**

How would action support the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

**Explain:**

The purpose of this project is to prevent an unacceptable rate of spread of gypsy moth onto adjacent public and private lands. This project is not designed or proposed to enhance a public purpose of wilderness.

Step 1 Decision: **Is it necessary to take action?**

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Yes: ☒ No: ☐ Not Applicable: ☐

**Explain:**

The purpose and need for this project is to eradicate gypsy moth by eliminating reproducing populations from the proposed treatment site. Through consistent implementation of management actions recommended by the Slow the Spread (STS) decision algorithm, the Forest Service, and its many state partners have reduced the rate of spread to about 3.5 miles per year. The STS algorithm takes numerous factors into account such as the growth of the population, the distance from the back of the STS action zone, distance ahead of the STS action zone, and the degree of isolation of that population.

For the treatment of gypsy moth to be allowable in wilderness under forest service manual direction, there must be an immediate threat of unacceptable damage to resources outside the wilderness boundary. Given the isolation of this gypsy moth population, the distance ahead of the action zone, and the rate of spread of gypsy moth when not treated, not treating the CCDW would likely create a pocket of infestation, which in turn, would expand the leading edge and create an unacceptable rate of spread.

In this proposal, the data and forest service policies support treating the proposed project area to eradicate gypsy moth.

If action is necessary, proceed to Step 2 to determine the minimum tool for action.
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<b>Step 2:</b> Determine the minimum tool.
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Description of Alternative Actions

For each alternative, describe what methods and techniques will be used, when the action will take place, where the action will take place, what mitigation measures are necessary.

Alternative # 1 - No action.

**Description:** With this alternative, no action to control or eradicate current population of the gypsy moth in the proposed treatment site would occur. Under this alternative as populations establish and spread, damage and regulatory action would occur sooner than if an action alternative is selected. Resulting effects of such quarantine would affect forest management activities and uses. Gypsy moth trappings surveys would also continue to monitor growing populations. This alternative is required for analysis by the National Environmental Policy Act but does not meet the purpose and need for action. Selection of this alternative would allow populations to establish, reproduce, and spread at a quicker rate.

Note: A quarantine of Monroe County would be established by the State Entomologist if action to control gypsy moth does not take place. The quarantine would prohibit the movement of certain articles out of Monroe County unless an inspection and certification takes place prior to movement. Such items

include, but are not limited to nursery stock and Christmas trees, logs, wood chips, mobile homes, outdoor household articles, such as grills, furniture, boats, doghouses, bicycles, garden tools, and recreational equipment such as tents, vehicles, and RV's. For detailed information about quarantine, refer to 7 CFR 301.45.

#### Alternative # 2 - Mating disruption

*Description: This treatment would apply one aerial application of pheromone flakes prior to the emergence of male moths. Treatment would occur in mid-June to early July. Mating disruption relies on the attractive characteristics of the gypsy moth sex pheromone, disparlure. The objective of mating disruption is to saturate the treatment site with enough pheromone sources to confuse the male moths and prevent them from finding and mating with female moths. Mating disruption is considered specific to gypsy moth and is not known to cause impacts to nontarget organism populations, water quality, microclimate, or soil productivity and fertility (USDA 1995, Vol. II, p. 4-67).*

*This treatment would use airplanes flying at low levels (about 50 feet above the trees) to drop plastic flakes that are impregnated with the gypsy moth pheromone. The formulation of Disrupt II (see Appendix D – example of product labels) consists of small plastic flakes, approximately 1/32 inch x 3/32 inch (1 x 3 mm) in size, thus the name “pheromone flakes”. A sticking agent, Monsanto's Gelva 2333, is applied to the flakes as they are dispersed from the aircraft, which aids in the distribution of the flakes throughout all levels in the forest canopy where mating could potentially occur. The flakes are green in color and applied at a rate of 6 to 15 grams active ingredient (disparlure) per acre. At the high rate of 15 grams, 85 grams of flakes are applied in 2 fluid ounces of sticker per acre (2 flakes per sq.ft.) (Thorpe et al. 2006). All of the ingredients in the Gelva 2333 sticker are considered non-hazardous to public health if used as an additive in the insecticide formulation (40 CFR 180.1001).*

Pheromone flakes have proven effective at eliminating gypsy moth at very low population levels. The application of pheromone flakes can meet the purpose and need for action of eliminating the gypsy moth population from the proposed treatment site.

#### Alternative # 3 - Btk

*Description: This treatment uses one or two applications of Btk at 24 to 38 billion international units (BIU) per acre applied from the air or ground. The applications would begin when leaf expansion is near 50 percent and when first and second instar caterpillars are present and feeding. This usually occurs between mid to late April through early May in central Indiana. The second application would follow no sooner than four days after the first application. Most commercial formulations of Btk are aqueous flowable suspension containing 48 or 76 BIU/gal. (Appendix D – Example of Product Labels). For aerial application at 24 to 38 BIU, less than 3.0 quarts of the product would be applied per acre.*

*Btk has been a commonly used treatment option in cooperative gypsy moth projects in Indiana and other states. Btk is a naturally occurring soil-borne bacterium that is mass-produced and formulated into a commercial insecticide. The Btk strain is effective against caterpillars, including the gypsy moth caterpillar. Caterpillars ingest Btk while eating the foliage. Once in the midgut, Btk becomes*

*active and causes death within a few hours or days (USDA 1995, Vol. II, p. A3-A5). Btk may impact nontarget species of spring-feeding caterpillars in the proposed treatment site, but the impact to the local population is usually very minimal as Btk rapidly degrades on the foliage within a few weeks, and the nontarget lepidopterans generally re-colonize treatment sites in less than 2 years (USDA 1995, Vol. II, p. 4-52 to 4-55). Human exposure to Btk provides little cause for concern, though direct exposure to the spray may cause temporary eye and respiratory tract irritation in a few people (USDA 1995, Vol. II, p. 4-13).*

*Btk has proven effective at eliminating gypsy moth at low level gypsy moth densities. Btk applications can meet the project objective of eliminating the gypsy moth population from the proposed treatment site.*

Alternative # 4 - Btk and mating disruption.

*Description: The use of this alternative provides flexibility to select Btk or mating disruption alone or in combination for each site based on the following criteria:*

- *gypsy moth population level,*
- *habitat type (urban, rural, open water or wetland),*
- *nontarget organisms,*
- *safety, and*
- *cost and project efficiency.*

The use of this alternative can meet the objective of eliminating gypsy moth populations from the proposed treatment site.

Application of mating disruption would be an aerial application and Btk would be applied with hand held sprayers.

<b>Comparison of Effects</b>
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Describe the effects in terms of possible protection and/or degradation of the wilderness resource and preservation of the wilderness character.

<b>Wilderness Character</b>
<p>Alt #1: <b>“Untrammeled”</b> – There would be no human influence to control gypsy moth, so there would be no trammeling due to control efforts. However, gypsy moth is an introduced species brought to the United States by human actions and its introduction alone may be considered trammeling.</p> <p><b>“Undeveloped”</b> – Not Applicable</p> <p><b>“Natural”</b> – The Charles C. Deam Wilderness would be influenced by a non-native species, Gypsy Moth, causing unnatural defoliation of trees and tree mortality.</p> <p><b>“Outstanding Opportunities for Solitude”</b> – Not Applicable</p>
<p>Alt #2: <b>“Untrammeled”</b> – Eradicating gypsy moth would be trammeling the wilderness. Gypsy moth would be eradicated with Disrupt II (Hercon Environmental, Emigsville, PA) mating disruption, which is a plastic laminated flake filled with disparlure and time released for about two months. The CCDW will be treated with mating disruption</p>

(Disrupt II) at the dose of 15 grams of active ingredient per acre (about 1 cup).

**“Undeveloped”** – Not Applicable

**“Natural”** – Disrupt II® contains the active ingredient disparlure (17.9%) and inert ingredients consisting of diatomaceous earth (3%), polyvinyl chloride films (also called PVC polymer), polyvinyl chloride resin and a plasticizer (79%). Both the pheromone and diatomaceous earth degrade or dissipate quickly (21% of Disrupt II). The other 79% is PVC polymer, resins, or plasticizers (Leonard 2008a, Hercon 2007, Thorpe *et al.* 2006). PVC breaks down 10 to 15 years after entering the environment.

The dose of 15 grams of active ingredient per acre equates to an application rate of 85 grams of Disrupt II per acre or about 1 cup of flakes distributed across an acre with deposits of about 2 flakes per square foot.

The total amount of plastics (PVC polymer, resins and plasticizers) added to the naturalness of the wilderness if all 1,050 acres of wilderness were treated with Disrupt II would be about 155 pounds (85 grams x .79 = 67 grams of plastics per acre x 1,050 acres = 70,350 grams/155 pounds). About 90% or more of the flakes are distributed throughout the tree canopy and about 10% are deposited on the forest floor (Thorpe *et al.* 2006). At leaf fall, the flakes would have begun to degrade from UV light and would be coated in dust. They would appear gray to brown in color instead of the original dark green. They would continue to be exposed to UV light and will be subject to freezing and thawing, furthering their degradation.

**“Outstanding Opportunities for Solitude”** – Mating disruption would be applied by an airplane flying about 50 feet above the tree canopy. Flights are expected to start approximately 6:30 am (or when light is sufficient for aircraft flight) and would take approximately 2 hours to complete the application. Application would most likely take place on a weekday in mid to late June.

It is possible to hear the products hit the canopy as they fall, a sound similar to a light rain shower. Due to the small size of the Disrupt II plastic flakes, they are extremely difficult to see, even to the trained eye looking for them. Impacts would be short-term and would likely affect few people.

Use of the CCDW is light on weekdays, especially early in the morning. The CCDW is not a destination wilderness, so few people camp overnight. Most use in the CCDW is day use. It is anticipated that few wilderness visitors would be impacted during application.

Alt #3: **“Untrammelled”** - Eradicating gypsy moth would be trammeling the wilderness. Gypsy moth would be eradicated with Btk, a naturally occurring soil-borne bacterium that is mass-produced and formulated into a commercial insecticide. The CCDW will be treated with Btk at the dose of around 3 quarts per acre.

**“Undeveloped”** – Not Applicable

**“Natural”** – Btk is a naturally occurring soil-borne bacterium. Application of Btk to eradicate gypsy moths is at a much higher concentration than occurs naturally. The naturalness of the area would be affected due to the introduction of chemicals. Btk will kill a wide variety of lepidopteron (species of moths and butterflies), not just gypsy

<p>Moth. Aerial application would result in exposure to some Regional Forester sensitive species, particularly the West Virginia white butterfly.</p> <p><b>“Outstanding Opportunities for Solitude”</b> – Btk would be applied by backpack sprayers or a low-flying airplane just above the tree canopy. Aerial applications are expected to start approximately 6:30 am (or when light is sufficient for aircraft flight) and would take approximately 2 hours to complete the application. Application would most likely take place on a weekday in mid to late April or early May. One or two applications of Btk would be needed. If a second application is needed, it would be at least four days after the first treatment.</p> <p>Use of the CCDW is light on weekdays, especially early in the morning. The CCDW is not a destination wilderness, so few people camp overnight. Most use in the CCDW is day use. It is anticipated that few wilderness visitors would be impacted during each application.</p>
<p>Alt #4: <b>“Untrammelled”</b> – Same as Alternatives 2 and 3 combined.</p> <p><b>“Undeveloped”</b> – Not Applicable</p> <p><b>“Natural”</b> – Same as Alternatives 2 and 3 combined.</p> <p><b>“Outstanding Opportunities for Solitude”</b> – Same as Alternatives 2 and 3 combined.</p>
<p><b>Biological and physical resource</b></p>
<p>Alt #1: No short term impacts. Long term impacts may include areas of infestation, defoliation of trees, and tree mortality. Defoliation may alter animal habitat and karst ecosystem characteristics. Defoliation may also have an impact on the aesthetics of the wilderness for some visitors.</p>
<p>Alt #2: No effect on Threatened and Endangered Species (McCreedy 2008a). Some effect on a few Regional Forester Sensitive Species (McCreedy 2008b). Plastic that would be added to the wilderness resource is approximately 155 pounds of plastic flakes spread over 1,050 acres (about 2 flakes every square foot). Due to the small size and color of the flakes, they are not likely to be visible to wilderness users in a forested setting.</p>
<p>Alt #3: No effect or not likely to adversely affect Threatened and Endangered Species (McCreedy 2008a). Some effect on a few Regional Forester Sensitive Species (McCreedy 2008b).</p>
<p>Alt #4: No effect or not likely to adversely affect Threatened and Endangered Species (McCreedy 2008a). Some effect on a few Regional Forester Sensitive Species (McCreedy 2008b). Plastic would be added to the wilderness resource, approximately 155 pounds of plastic flakes spread over 1,050 acres (about 2 flakes every square foot). Due to the small size and color of the flakes, they are not likely to be visible to wilderness users in a forested setting.</p>
<p><b>Social and experiential resource</b></p>
<p>Alt #1: Monroe County would likely become a quarantine county under 7 CFR 301.45, which means all wilderness visitors (overnight and day use) will be subjected to inspections of vehicles and recreational equipment.</p>
<p>Alt #2: Low level aircraft on the day of treatment.</p>
<p>Alt #3: Low level aircraft on the day of treatment.</p>
<p>Alt #4: Low level aircraft on the day(s) of treatment.</p>
<p><b>Heritage and cultural resource</b></p>

Alt #1: None
Alt #2: None
Alt #3: None
Alt #4: None

<b>Maintaining contrast and unimpaired character</b>
Alt #1: Impacts may include areas of infestation, defoliation of trees, and tree mortality. These impacts would be caused by nature (gypsy moth). However, gypsy moth is an introduced species brought to the United States by human actions.
Alt #2: Control of gypsy moth would allow the area to look the same as it does today, which leaves the area unimpaired.
Alt #3: Control of gypsy moth would allow the area to look the same as it does today, which leaves the area unimpaired.
Alt #4: Control of gypsy moth would allow the area to look the same as it does today, which leaves the area unimpaired.
<b>Special Provisions</b>
Alt #1: None
Alt #2: None
Alt #3: None
Alt #4: None
<b>Safety of visitors, personnel, and contractors and work methods</b>
Alt #1: If no action is taken, there would be no safety concerns associated with control of gypsy moth. However, long term concerns could include tree mortality, which could cause trees to fall across trails or in campsites potentially injuring wilderness visitors.
Alt #2: The use of aircraft has an inherent level of risk. Risk to visitors can be minimized by notifying the public about location and times of treatment.
Alt #3: The use of aircraft has an inherent level of risk. Risk to visitors can be minimized by notifying the public about location and times of treatment.
Alt #4: The use of aircraft has an inherent level of risk. Risk to visitors can be minimized by notifying the public about location and times of treatment.
<b>Economic and time constraints</b>
Alt #1: Short term, cost and time of annual monitoring and trapping by IDNR. Long term, there is potential for a gypsy moth infestation. The infestation could become severe enough that treatment would occur. However, the cost and time to control will be higher after an infestation has occurred versus stopping an infestation from occurring in the first place.
Alt #2: Cost and time of annual monitoring and trapping by IDNR.
Alt #3: Cost and time of annual monitoring and trapping by IDNR.
Alt #4: Cost and time of annual monitoring and trapping by IDNR.
<b>Additional, wilderness-specific comparison criteria</b>
Alt #1: None
Alt #2: None
Alt #3: None
Alt #4: None

<b>Step 2 Decision:</b> What is the Minimum Tool?
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This section documents the decision made for this project.

**The selected alternative is:** Alternative 2, use of mating disruption only.

**Describe the rationale for selecting this alternative:** The purpose and need for this project is to eradicate gypsy moth by eliminating reproducing populations from the proposed treatment site.

Excluding the CCDW from treatment cannot be reasonably expected to eradicate gypsy moth from the proposed treatment site.

Mating disruption is specific to the gypsy moth and thus would have no adverse impact on non-target species in the wilderness.

There are two mating disruption products registered with Environmental Protection Agency. Disrupt II and SPLAT-GM (ISCA Technologies, Riverside, CA). However, at this time, SPLAT-GM is still in operational testing on small study plots and equipment used for large scale application of SPLAT-GM is not ready for use (Leonard 2008b). SPLAT-GM will not be available for use in 2008. Disrupt II is the only product which may be used for treatment of gypsy moth.

Social impacts and impacts to wilderness character are minimal. Social impacts of controlling gypsy moth are likely to only occur on the day of treatment. Impacts to wilderness character are mainly adding human made plastic to a natural wilderness setting. The plastic is small in size and will be very difficult to detect.

The potential negative impacts of a gypsy moth infestation spreading outside the CCDW boundary outweigh the impacts to wilderness character.

The George Washington Jefferson National Forest has also analyzed gypsy moth treatment in two wilderness areas and six proposed wilderness study areas totaling 17,844 acres. They also determined that controlling gypsy moth can not be obtained without treating wilderness or proposed wilderness.

The use of Btk as described in Alternatives 3 and 4 is not needed for this project in the Charles C. Deam Wilderness. Btk is used when gypsy moth eggs are detected. Gypsy moth eggs have not been detected in the Charles C. Deam Wilderness, so the use of Btk is not necessary.

**Describe any monitoring and reporting requirements:** IDNR will monitor the day of application. The project area will be monitored with pheromone traps in upcoming years determine the effectiveness of the treatments. The Hoosier National Forest has requested funding for additional long-term monitoring such as affects to karst environments, wildlife and plant species, and how the plastics biodegrade.

Please check any Wilderness Act Section 4(c) uses approved in this alternative:

- |   |  |
|---|--|
| <input type="checkbox"/> mechanical transport | <input type="checkbox"/> landing of aircraft       |
| <input type="checkbox"/> motorized equipment  | <input type="checkbox"/> temporary road            |
| <input type="checkbox"/> motor vehicles       | <input type="checkbox"/> structure or installation |
| <input type="checkbox"/> motorboats           |  |

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<b>Approvals</b>	<b>Signature</b>	<b>Name</b>	<b>Position</b>	<b>Date</b>
Prepared by:	/s/ Eric Sandeno	Eric Sandeno	Outdoor Recreation Planner	1/22/2008
Recommended:	/s/ Lester Wadzinski	Lester Wadzinski	Recreation Program Manager	1/22/2008
Recommended:	/s/ John Romanowski	John Romanowski	Regional Wilderness, Wild & Scenic River Program Manager	1/23/2008
Approved by:	/s/ Kenneth G. Day	Kenneth G. Day	Forest Supervisor	1/28/2008